

FUTURES EDUCATIONAL SYSTEMS

PRACTICAL LEARNERS' GUIDE

MATHEMATICS

6th PRIMARY
1ST TERM

2024 - 2025

NAME:
CLASS:

PREFACE

Dear beloved students

MATHEMATICS CANNOT BE LEARNED WITHOUT BEING LOVED .

A STUDENT WHO WANTS TO BE A MATHEMATICIAN ,A GOOD MATH STUDENT, OFTEN HAS TO SPEND TIME IN THE LIBRARY .

A GOOD MATHEMATICIAN HAS TO REFER TO MANY BOOKS, BUT HE/SHE CANNOT READ A MATH BOOK LIKE A NOVEL.

DON'T BE AFRAID OF MAKING A MISTAKE, AND IF YOU DO, YOU SHOULD JUST CROSS IT.

MATHEMATICS INTRODUCES CHILDREN TO CONCEPTS, SKILLS AND THINKING STRATEGIES THAT ARE ESSENTIAL IN EVERYDAY LIFE AND SUPPORT LEARNING ACROSS THE CURRICULUM. ... THEY LEARN TO EXPLORE AND EXPLAIN THEIR IDEAS USING SYMBOLS, DIAGRAMS AND SPOKEN AND WRITTEN LANGUAGE.

MATHEMATICS OFFERS CHILDREN A POWERFUL WAY OF COMMUNICATING



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Unit 1

Lesson 1: Using long division in the real world

Example 1:

78 volunteers volunteered in the food bank, and the total number of working hours was 9,689 in a year. If each volunteer worked the same number of hours equally. How many hours did each volunteer work in a year?

Sol:

```
       124
    ┌─────
78  │ 9689
      78
      ───
      188
      156
      ───
      329
      312
      ───
       17
```

$78 \times 1 = 78$

$78 \times 2 = 156$

$78 \times 3 = 234$

$78 \times 4 = 312$

$78 \times 5 = 390$

$78 \times 6 = 468$

Number of working hours of each volunteer = 9,689 ÷ 78 = 124 hours

9689	÷ 78	= 124	R17
Dividend	divisor	quotient	remainder

Example 2:

During a charity campaign for the Food Bank, 6,982 food packages were collected and placed in 93 food cartons, where each carton contains the same number of food packages. If the Food Bank wants to put the largest number of food packages in each carton, then how many packages will each carton contain?

Sol:

```
       75
    ┌─────
93  │ 6982
      651
      ───
      472
      465
      ───
        7
```

$93 \times 1 = 93$

$93 \times 2 = 186$

$93 \times 3 = 279$

$93 \times 4 = 372$

$93 \times 5 = 465$

$93 \times 6 = 558$

$93 \times 7 = 651$

$93 \times 8 = 744$

Number of packages will each carton contain = 6,982 ÷ 93 = 75 packages

6982	÷ 93	= 75	R7
Dividend	divisor	quotient	remainder



(1) 84 ÷ 3 = ...	(2) 156 ÷ 6 = ...	(3) 839 ÷ 9 = ...
.... ⟌	.... ⟌	.... ⟌ ....

(4) 360 ÷ 15 = ...	(5) 888 ÷ 32 = ...	(6) 615 ÷ 41 = ...
.... ⟌	.... ⟌	.... ⟌ ....



(7) 1475 ÷ 5 = ……… ……… | ………	(8) 3776 ÷ 8 = ……… ……… | ………	(9) 4935 ÷ 7 = ……… ……… | ………

(10) 858 ÷ 78 = …… ……… | ………	(11) 4935 ÷ 47 = ……… ……… | ………	(12) 15632÷ 45 = ……… ……… | ………





Exercises: Using division in the world around us

➢ ***Choose the correct answer:***

1) If 384 ÷ 16 = 24, then the dividend is ……..

a. 384 **b.** 16 **c.** 24 **d.** 0

2) If 40 ÷ 5 = 8, then the remainder is ……..

a. 40 **b.** 5 **c.** 8 **d.** 0

3) If 29 ÷ 3 = 9 R2, then the divisor is ……..

a. 29 **b.** 3 **c.** 9 **d.** 2

4) If Mona has 17 oranges and she wants to distribute them equally among 3 of her friends, how many oranges are left?

a. 17 **b.** 3 **c.** 5 **d.** 2

5) Salma made 47 cookies which she will distribute equally in tiny glass jars. If each jar is to contain 6 cookies each, how many cookies will not be placed in a jar?

a. 47 **b.** 5 **c.** 6 **d.** 7

6) Noha baked cookies for her classmates. If she can placed 12 cookies on a tray. How many trays will she need to prepare 276 cookies?

a. 12 **b.** 21 **c.** 22 **d.** 23

7) Ahmed has 120 crayons distribute them among 6 of his friends, how many crayons are left?

a. 0 **b.** 1 **c.** 2 **d.** 3

8) Which is the correct relation represents the following statement: (distribute 16 crayons equally among 4 students)

a. 16 × 4 **b.** 16 ÷ 4 **c.** 16 + 4 **d.** 16 – 4



Exercises: Using division in the world around us

➢ ***Which situations involve division? Identify all that apply:***

1) The 78 volunteers at the food bank donated a total of 9,672 hours for the year. Each volunteer worked the same number of hours. How man, hours did each volunteer donate to the food bank?

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2) The food bank can make one food box that can feed one person, 3 meals per day for two weeks. How many total meals can one food box make?

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3) The food bank's top donor donated 1,250 tokens at each of 10 different fundraisers. What is the total donation for all fundraisers?

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4) With the 6,975 cans of food collected during the food bank's largest food drive, 93 meal boxes were created with the same number of cans in each box. In order for the food bank to use the most cans, how many cans would be in each box?

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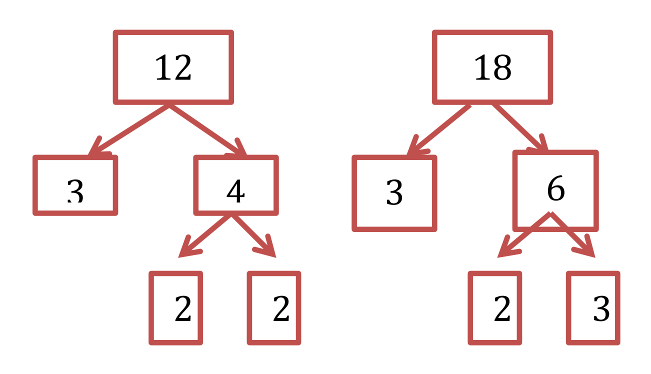
Lesson 2

Factorize the number into its prime factor

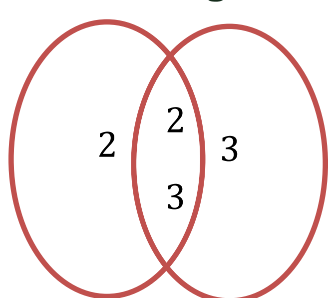
➢ Use Venn diagram to find (G.C.F) and (L.C.M):

EX: Find (G.C.F) and (L.C.M) of the numbers 12, 18 by using Venn diagram

Sol:



Venn diagram



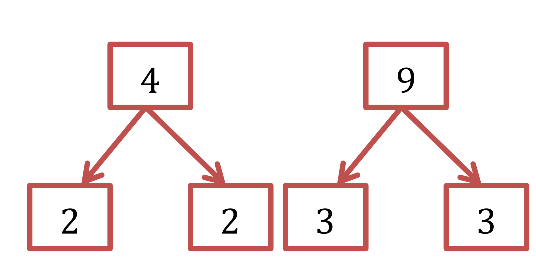
$12 = 2 \times 2 \times 3$

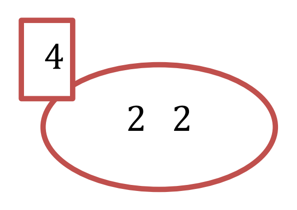
$18 = 2 \times 3 \times 3$

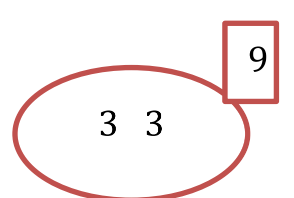
•From Venn diagram:

G.C.F = $2 \times 3 = 6$ (Multiply the common factors inside Venn diagram)

EX: Find (G.C.F) and (L.C.M) of the numbers 4, 9 by using Venn diagram







$4 = 2 \times 2$

$9 = 3 \times 3$

✓ ***From Venn diagram:***

G.C.F = 1

L.C.M = 2 × 2 × 3 × 3 = 36 (Multiply all the numbers inside Venn diagram)

Notes:

- The common factor of all numbers is 1
- The greatest common factor (G.C.F) of any two prime numbers is 1
- The G.C.F of the two numbers which haven't any common prime factors is 1
- The common multiple of all numbers is 0
- The (L.C.M) of any two prime numbers is their product.



➢ ***Factorize each of the following to its prime factors***

a) 4	b) 6	c) 10
d) 8	e) 12	f) 20
g) 16	h) 24	i) 36



➢ ***Find using venn diagram the GCF and LCM of :***



➢ ***Factorize each of the following to its prime factors:***

a) 8 and 10
b) 12 and 16
c) 4 and 9
d) 14 and 16

➢ ***Complete each of the following***

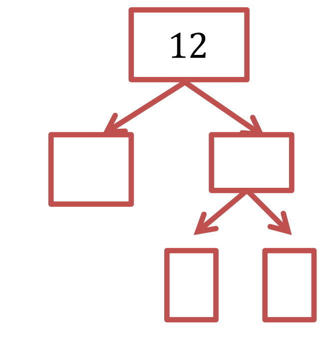
1. The smallest prime number is …………………
2. The smallest odd – prime number is ………..
3. The number that its prime factors are 2, 3, 5 is ………..
4. The prime factors of 15 are …………..
5. The GCF of 2 and 4 is …………
6. The LCM of 10 and 5 is ………..

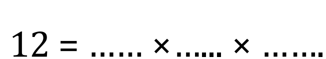


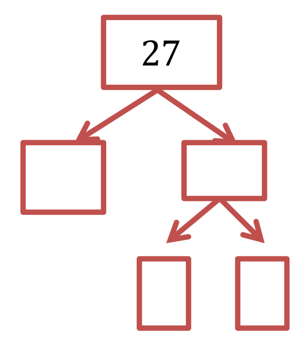
- ***Complete each of the following***

1. The prime number between 32 and 40 is ....
2. All prime number are odd except ....
3. The number that its prime factors are 5, 7 is ....
4. The prime factors of 35 are ....
5. The GCF of 12 and 16 is ....

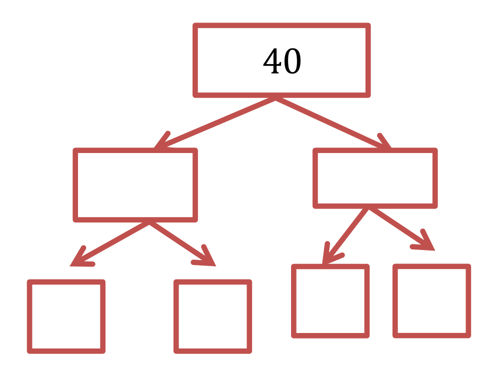
- ***Factorize each of the following to its prime factors***







27 = ... ×...... × ....



40 = ... ×...... × .... × ....

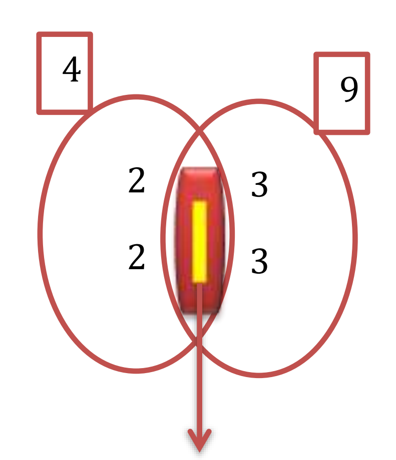
- ***Find using venn diagram the GCF and LCM of***

1) 25 and 45
2) 16 and 14



Learn → Relatively Prime number

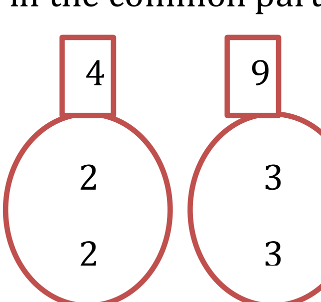
They are numbers whose only common factor is 1
So they are prime numbers with respect to each other
Ex. 4 and 9 are composite numbers. 4 = 2 x 2 9 = 3 x 3 ▪ The greatest common factor of 4 and 9 is 1 ▪ Therefore 4 is a prime number with respect to 9. ▪ 9 is a prime number with respect to 4.



When there is no prime factors in the common part, then GCF = 1

No common prime factors

So, we draw two distant circles

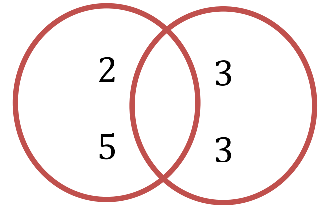


Note:

The lowest common multiple of the relatively prime numbers is their product.

Ex, the common multiple of 4 and 9 is 4 x 9 = 36

➢ ***Using the following venn diagram,***



1. The two numbers represented in the venn diagram are …….. and ……………..
2. The common prime factors of the two numbers are ………………………
3. The GCF for the two numbers is …………………………
4. The LCM for the two numbers is …………………………
5. Are the two numbers relatively prime number? …………………………

(Yes Or No ?)

Lesson 3

Writing numerical expression by using G.C.F

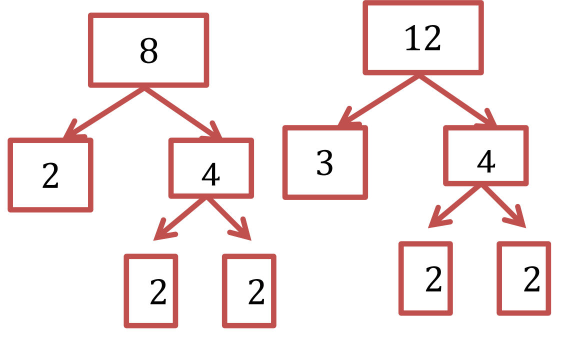
Writing numerical expression by using (G.C.F):

EX:

Sarah wanted to make a number of cartons to donate to charitable organizations; if she had 8 boxes of cheese and 12 bags of legumes, what is the largest number of cartons that can be made so that all cartons include the same number of items?

1. Prime factorization

2. Venn diagram



Number of first in each carton

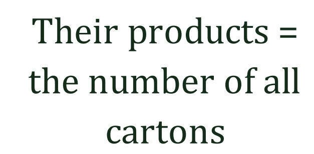
Number of second in each carton

2 | 2 3 | 3

$8 = 2 \times 2 \text{ x } 2$

$12 = 2 \times 2 \quad \text{x } 3$

$4 \quad \text{x } (2 + 3)$



So, Numerical expression: $(4 \times 2) + (4 \times 3)$ the total number of items: $8 + 12 = 20$

Means that: We have 4 cartons each carton has 2 boxes of cheese and 3 bags of legumes

EX:

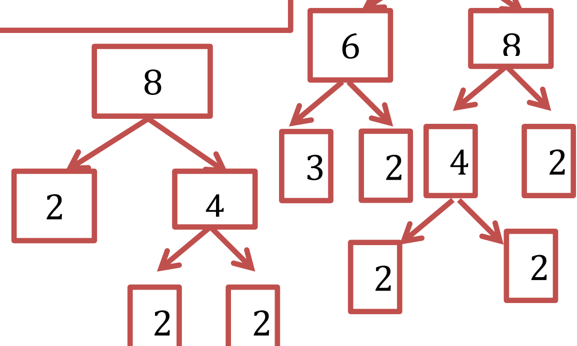
The students collected 36 boxes of cheese and 48 bags of legumes. What is the largest number of baskets of food that can be prepared without any food left?

36 = $2 \times 2 \times 3 \times 3$

48 = $2 \times 2 \times 3 \quad \times 2 \times 2$

$= \quad 12 \times (3 + 4)$

$= (12 \times 3) + (12 + 4)$





- ***The Distributive Property states that multiplying a number by the sum of two addends is the same as multiplying that number by each addend individually and then adding those products.***

EX. 7 x (3 + 9) = (7 x 3) + (7 x 9)

- ***Complete the following:***

A. 5 x (3+6) = (………… X ………) + (………… X ………)
B. ………………. x (………… X ………) = (7 x 2) +(7 x 4)
C. 8 x (………… X ………) = (………. x 9) + (………..x 2)
D. ………… X (4 + 6) = (9 x ………) + (9 x ……………..)
E. The GCF for 9 and 6 is ………………….
F. The GCF of all numbers is …………

- ***Answer the following:***

A. Samo has 12 red crayons and 5 blue crayons, What is the greatest number of groups can Samo divide the crayons into so that all groups contain the same number of both colors?

……
……
……

B. Marwa divided 12 oranges and B candies into bags so that the bogs contained the same number of oranges and the some number of candies writes a numerical expression for this situation.

……
……
……



Choose the correct answer :-

1. A Student is given 20 packs of cheese and 40 grain bogs to make food boxes. He uses the expression 10 2+4 to represent how many boxes he could make with equal amounts of food in each box His friend tells him that there is a way to make more boxes. Which one of these expressions would represent his friend's solution?

   A. 20(2+4) B. 10(1+21) C. 10(1+4) D. 20(1+2)

2. 30+ 50 = ……………………..

   A. 10 (3+ 5) B. 5(6+5) C. 10(30+50] D. 2(15+5]

3. Petra is making packs for a group of her friends going a trip. Each pack should have the same number of sandwiches and same number of juice if she has 24 sandwiches and 30 juices what is the expression greats number of packs that she can make with no any left over?

   A. 2 (12+ 15) B. 3(8 +10) C. 4(6 + 5] D. 6(4 + 5]

4. 7(2 + 1) = ……………………..

   A. 14 + 7 B. 14 + 1 c. 14 + 71 D. 72 + 71

5. 5(2 + …………………) = 10 +35

   A. 5 B. 7 c. 2 D. 8

6. 9(1 + 2) = 9 + ……………………

   A. 9 B. 81 c. 18 D. 27



Lesson 4

Factorize the least multiple

Adding and subtracting fractions with like denominators:

Ahmed has 3 equal bags of oranges. He wanted to taste the fruit inside each bag to make sure of its quality, the following table represents that:

			The sum
The whole	$\frac{6}{6}$	$\frac{6}{6}$	$\frac{6}{6}+\frac{6}{6}=\frac{12}{6}=2$
What Ahmed ate	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{3}{6}+\frac{4}{6}=\frac{7}{6}=1\frac{1}{6}$
Remainder	$\frac{6}{6}-\frac{3}{6}=\frac{3}{6}$	$\frac{6}{6}-\frac{4}{6}=\frac{2}{6}$	$\frac{3}{6}+\frac{2}{6}=\frac{5}{6}$

Generally: when we add or subtract any two fractions with like denominators, we add or subtract the numerators with the same denominators.

EX: $\frac{1}{5}+\frac{2}{5}=\frac{3}{5}$ EX: $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$

EX: $\frac{5}{7}-\frac{3}{7}=\frac{2}{7}$ EX: $2\frac{1}{6}-\frac{3}{6}=1\frac{4}{6}$

Adding and subtracting fractions with unlike denominators:

Ahmed wanted to make a meal of oranges and pears by use half bag of oranges and $\frac{1}{4}$ of bag of pears, the following table represents that:

			The L.C.M of denominators	The sum
The whole	$\frac{6}{6}$	$\frac{4}{4}$	$6 = 2 \times 3$ $4 = 2 \times 2$	$\frac{12}{12}+\frac{12}{12}=2$
What Ahmed ate	$\frac{3}{6}$	$\frac{1}{4}$		$\frac{6}{12}+\frac{3}{12}=\frac{9}{12}$
remainder	$\frac{6}{6}-\frac{3}{6}=\frac{3}{6}$	$\frac{4}{4}-\frac{1}{4}=\frac{3}{4}$	L.C.M $= 2 \times 3 \times 2 = 12$	$\frac{6}{12}+\frac{9}{12}=\frac{15}{12}=1\frac{3}{12}$



A. Find the result:

1- Add :-

$\frac{3}{5} + \frac{1}{5} =$ …………….	$\frac{2}{7} + \frac{6}{7} =$ …………….	$5\frac{1}{4} + \frac{2}{4} =$ …………
$\frac{1}{4} + \frac{2}{4} =$ …………….	$\frac{1}{6} + \frac{5}{6} =$ …………….	$2\frac{3}{8} + 1\frac{7}{8} =$ ……….
$\frac{3}{11} + \frac{7}{11} =$ …………	$\frac{2}{3} + \frac{2}{3} =$ …………….	$1 + \frac{2}{9} =$ …………….
$\frac{1}{3} + \frac{1}{4} =$ …………….	$\frac{1}{5} + \frac{1}{3} =$ …………….	$2\frac{1}{2} + \frac{2}{4} =$ …………
$\frac{1}{4} + \frac{2}{12} =$	$\frac{1}{5} + \frac{5}{5} =$ …………….	$2\frac{3}{4} + 3\frac{7}{3} =$ ……….
$\frac{3}{3} + \frac{7}{3} =$ …………	$\frac{7}{10} + \frac{5}{6} =$	$1 + \frac{2}{7} =$ …………….

2- Subtract:-

$\frac{7}{8} - \frac{3}{8} =$ …………….	$3\frac{3}{5} - 1\frac{1}{5} =$ …………	$3 - \frac{1}{5} =$ …………….
$\frac{3}{5} - \frac{1}{5} =$ …………….	$5\frac{3}{7} - \frac{6}{7} =$ …………….	$5 - 1\frac{2}{7} =$ …………….
$\frac{7}{13} - \frac{4}{13} =$ …………….	$4\frac{2}{5} - 1\frac{4}{5} =$ ……….	$1 - \frac{3}{8} =$ …………….
$\frac{5}{6} - \frac{3}{8} =$ …………….	$\frac{1}{4} - \frac{1}{5} =$ …………….	$1\frac{1}{12} - \frac{5}{9} =$ ……….
$\frac{5}{6} - \frac{7}{12} =$ …………….	$\frac{5}{6} - \frac{1}{2} =$ …………….	$6\frac{4}{5} - 2\frac{1}{4} =$ ……….
$\frac{3}{4} - \frac{2}{3} =$ …………	$\frac{5}{7} - \frac{2}{3} =$ …………….	$3\frac{2}{3} - 1\frac{2}{5} =$ ……….





$\frac{1}{5} + \frac{1}{8} =$ ………………	$\frac{3}{7} + \frac{2}{5} =$ ………………	$2\frac{1}{3} + 1\frac{1}{2} =$ …………
$\frac{1}{4} + \frac{1}{12} =$ ………………	$\frac{1}{4} + \frac{2}{3} =$ ………………	$1\frac{3}{5} + \frac{1}{3} =$ …………
$\frac{7}{10} + \frac{5}{6} =$ ………………	$\frac{3}{4} + \frac{4}{5} =$ ………………	$3\frac{2}{8} + 2\frac{1}{6} =$ …………
$4\frac{2}{3} - 2\frac{1}{4} =$ …………	$1\frac{1}{12} - \frac{5}{9} =$ …………	$10\frac{1}{2} - 5\frac{1}{3} =$ ………
$9\frac{3}{7} - 4\frac{1}{6} =$ …………	$8\frac{11}{12} - 7\frac{3}{4} =$ …………	$10\frac{1}{4} - 3\frac{1}{12} =$ ………
$5\frac{5}{8} - 1\frac{1}{3} =$ …………	$9\frac{1}{6} - 4\frac{4}{9} =$ …………	$4\frac{1}{2} - \frac{1}{4} =$ …………

A. ***Choose the correct answer*** :-

4) $\frac{5}{6} - \frac{3}{5} =$ ……………

a) $\frac{7}{30}$ b) $\frac{8}{30}$ d) $\frac{9}{30}$ c) $\frac{1}{3}$

5) The equivalent fraction of $\frac{12}{15}$ is ……………

a. $\frac{2}{5}$ B. $\frac{3}{4}$ $c)\frac{4}{5}$ $d)\frac{1}{3}$

6) $2\frac{3}{4} + 1\frac{2}{3} =$ ………

a) $3\frac{5}{12}$ b) $4\frac{5}{12}$ $c)\ \frac{17}{12}$ d) 4



4. Answer the following:

1) Salma bought $3\frac{1}{2}$ kg of tomato, and $1\frac{1}{4}$ kg of onion. How much vegetable did she buy?

……
……
……

2) Basma walked $2\frac{3}{4}$ km on Sunday, and $1\frac{1}{3}$ km on Monday. What distance did she walk in all?

……
……
……

3) Ali bought a bottle of juice contains $1\frac{3}{4}$ liters of orange juice. He drank $\frac{2}{5}$ liter of juice. How much of juice is left in the bottle?

……
……
……



Revision

1. ***Answer the following:***

Find G.C.F and L.C.M of 12 and 18 by two methods.

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

A factory produces 875 pieces of cloth weekly. How many pieces did the factory produce daily?

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

2. ***Complete the following.***

a) 6(7 + 9) = 42 + ………………………

b) 5 x 3 + 5 x 7 = 5 (…………… + …………)

c) 26,900 ÷ 43 = ………………………

d) The common multiple of all numbers is ……………………………

3. ***Choose the correct answer.***

(1) 20 + 25 = ……….

a. 2(0 + 5) b. 5(5 + 2) c. 5(4 + 5) d. 20(0 + 5)

(2) 13,510 ÷ 23 = 587R …………..

a. 9 b. 8 c. 7 d. 6

(3) Youssef saves 105 LE. Weekly. How much did he save daily?

a. 15 b. 98 c. 735 d. 112

(4) From the opposite venn diagram, the expression is ………………..

a. 10(6 + 35) b. 3(10 + 7)

c. 7(10 + 3) d. 10(3 + 7)

3 | 2, 5 | 7



4. *Complete the following.*

A. The L.C.M of 5 and 7 is ………………

B. 8,529 ÷ 25 = 341 R ……………………

C. The common factor of all numbers is ……………..

D. In the opposite venn diagram the G.C.F is ……………

E. The divisor in the equation 16,692 ÷ 52 = 321 is ……………

5. *Choose the correct answer*

(1) …………….. is a multiple of any number

a. 3 b. 2 c. 1 d. 0

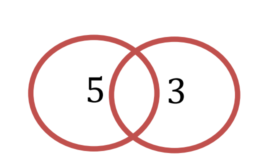
(2) In the equation 2,150 ÷ 25 = 86, the remainder is …………..

a. 0 b. 25 c. 86 d. 2,150

(3) Which of the following are relatively prime numbers? ………..

a. 4 and 8 b. 12 and 18 c. 2 and 12 d. 9 and 4

(4) In the opposite venn diagram the L.C.M is ……………



a. 0 b. 1 c. 15 d. 8

(5) 2,574 ÷ 7 = …………………………

a. 376 R 5 b. 367 R 5 c. 367 d. 376

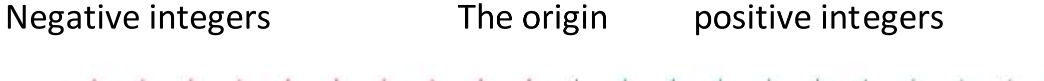


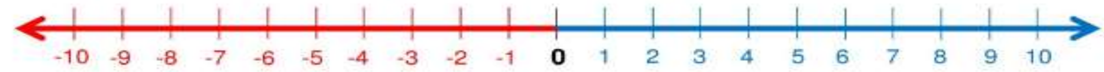
Unit 2 : Rational Numbers

Lesson 1: Counting numbers , natural number & Integer numbers

- Counting numbers: 1, 2, 3, 4, …
- Natural numbers: 0,1,2,3,4,…………………
- Integer numbers : ……….,-4,-3,-2,-1,0,1,2,3,4,…………………

Negative integer and zero and positive integers
Or negative integers and zero and counting numbers
Or negative integers and natural numbers

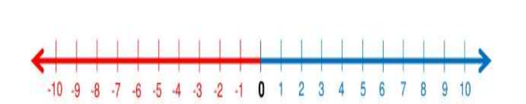


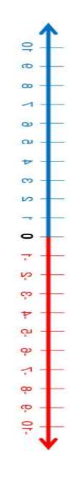


-The negative integers are to the left of zero .
- the point that represents 0 is called (the origin)
- the positive integers are to the right of zero .

- Representing integers on number line :

1-horizantal number line : 2-vertical number line :







Notes :

- Integer numbers are infinite
- The smallest positive integer is 1.
- The greatest negative integer is -1.
- The number zero neither negative nor positive number.
- Zero is smaller than any positive integer number.
- Zero is greater than any negative integer number.

1) chooce the correct answer :

a. which is an integer ?

[-0.2 or $\frac{1}{2}$ or -10 or $3\frac{1}{2}$]

b. the smallest counting number is ………………..

[0 or 1 or -1 or -10]

2) write an integer to represent each the following situation .

a. A temperature of 3 degrees below zero . [………]

b. A bank deposit of 100 L.E. [………]

c. A loss of 5 L.E. [………]

3) Represent each of the following numbers on the horizontal number line .

a. 4, -2 , 0 , 3 , -5

…………………………………………………………………………………………………

b. -2 , -1 , 0 , 1 , 2

4) Represent each of the following numbers on the vertical number line .

a. 10 , -2 , -3 , 5 , 3

b . -4 , -3 , -2 , -1 , 0 , 1



Life situations of integers:

Ex : write an integer to represent each situation :

1) The orange juice freezes at 6 c° below zero

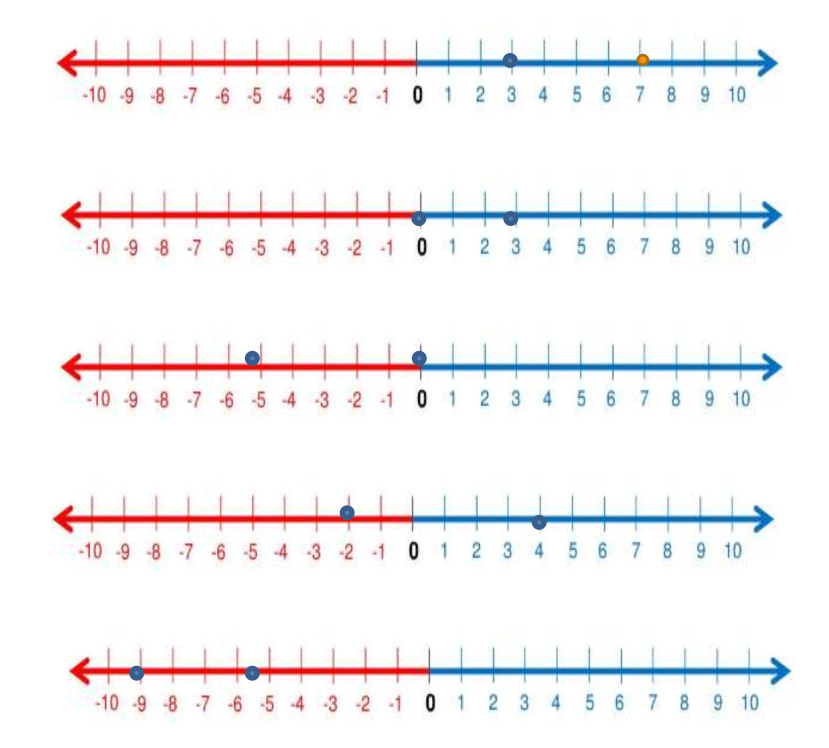
2) Ahmed walked 5 steps forward

3) A building is 12 m high

4) Amir diving 7m below sea level

Find the distance between two integer numbers on the number line :

Ex : Find the distance between each two integer numbers on the number line :



Note :

. the distance between any two numbers is always positive .

. we can write positive numbers by two ways :

Ex : 2 or +2



1) Which of the following is an integers ?

a. -31 b.7.3 c. $-\frac{3}{7}$ d.0

2) complete :

a) the smallest natural number is ……………. And the smallest counting number is ……………….

b) the integers between -3 and 2 are ……………….

c) the number ………. is neither positive nor negative .

d) the integer which just next -4 is ………………

e) the integer which just before -10 is ………………

f) the number of integers between -4 and 3 is …………

g) the smallest non negative integer is ……….and greatest non- positive integers is ………….

h) the smallest positive integer number is …………… and the greatest negative integer number is ……………….

3) write an integer to represent each situation :

a) A temperature is 12°C below zero . (……….)

b) she is diving 10m below sea level . (……….)

c) Ahmed withdraws 6000pounds from his bank account . (……….)

d) the tree is 4m high. (……….)

e) 3 steps forward . (……….)

f) Abank deposit of 750 L.E. (………..)

g) A loss of 20L.E. (……….)

h) A gain of 7 kilograms. (……….)

i) A profit of 100 L.E. (……….)

j) A decrease of 200 L.E. (……….)

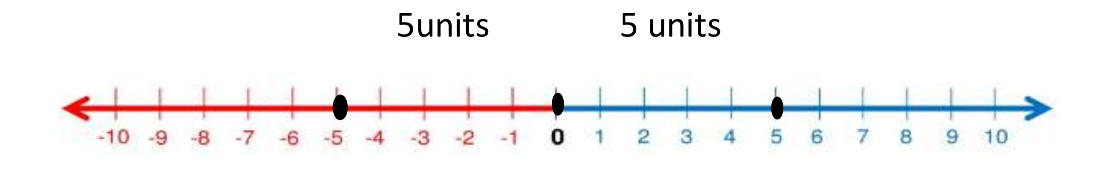


<u>Lesson 2</u>: the opposite number (additive inverse)

On the number line any two numbers that are at the same distance from zero and on two opposite position of it are called opposites or additive inverse

<u>For example:</u>

5units 5 units



opposites or additive inverses

Each of the integers 5 and -5 has the same distance away from 0 therefore 5 and -5 are <u>opposites</u> .

Note that :
a. The opposite of 5 is -5
. The opposite of -5 is 5
. The opposite of the opposite of 5 is – [-5] which is 5
b. The opposits of 0 is 0

<u>4-Write the opposite of each integers :</u>

a) -5 …………… b) 6 …………… c) 0 ………………

d) -16……………… e) 1000 ………… F) -(-4) ……………

5-<u>write each statement ,filling in each blank with inequality symbol,<or>;</u>

a) -7…………..-3 b) 8…………..0

c) 3 …………4 d) 2 ………… -9

e) -6…………0 f) 2 …………..-2



6) Which are true ? select all the true statements.

a) A number and its additive inverse are the same distance away from zero on a number line but on opposite sides .

b) zero is its own additive inverse .

c) To show 5 and its additive inverse on anumber line count 5 units and plot the point 5 units to the right of 0 . then , plot the point 5 units to the left of 0.

d) The additive inverse of any number is zero .

7) Arrange the following integers from least to greatest :

a) -6 , 0 , -4 , 4 ,-7 , 3

…………………………………………………………………………………….

b) 7 , -7 , -3 , -5 , 11 , -11 .

……………………………………………………………………………………

8) Arrange the following integers in an ascending order :

4 , -5 , 1 , -3 , 0 , 6 , -7 and -1

9) the distance between the number 2 and its opposite on the number line equals ……….. units .

10) the distance between the opposite of 4 and 0 on the number line equals ……… units .

Lesson 3 : Analyyzing Rational number by using models :

What is rational number ?

A rational number is any number that can be written in form $\frac{a}{b}$, where a and b are integers and b $\neq 0$

Example : All 5 ,-3 , 0 , $3\frac{1}{8}$, 0.28 , can be written in the form $\frac{a}{b}$ as :

$\frac{5}{1}$, $\frac{-3}{1}$, $\frac{0}{1}$, $\frac{25}{8}$, $\frac{28}{100}$



Write the following numbers in the opposite venn diagram

$\frac{3}{4}$, 782 , 0 , -10 , -0.5 , 15 , -6 , $7\frac{12}{13}$

Write the given rational number in fraction form $\frac{a}{b}$:

a. -3 b.-0.31 c. $3\frac{3}{9}$ d.2.5

Note
.Any collection of numbers is called a set as “set as rational numbers “
.Each rational number is called an element of the set of rational numbers.

Match the numbers to the best subset:

Rational numbers	integer	counting number	natural number

a.0.785 .... b .$\frac{2}{8}$ .... c.-439..............

d.-2 .... e. 0................ F.4.6 ....

g.5.............. h. 17266........... i.-35 ....

Rational numbers

Integers

not integers fraction and decimals

negative integers

natural numbers zero and counting

Belonging of an element to aset ;

We can say that -3 belongs to set of integers but -3 does not belong to set of natural number .



Example :

$\frac{1}{2}$ belongs to set of rational numbers

0 does not belong to set of counting numbers .

Example :

Write ‘belong’ or ‘does not belong ‘.

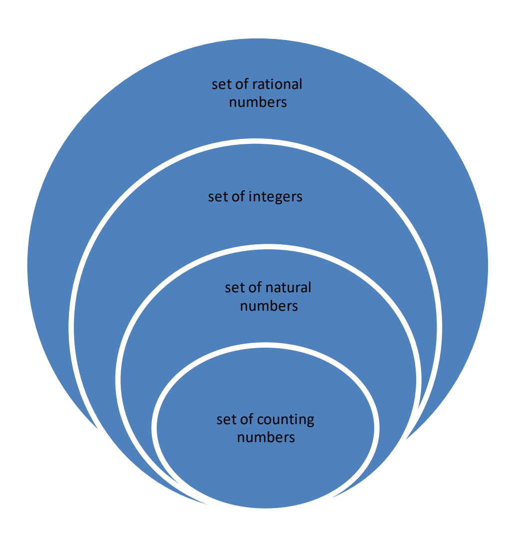
a .$-\frac{3}{7}$ ……………..to set of integers.

b.0……………to set of natural numbers.

c.-4 …………….. to set of counting numbers.

d. 0 ………………..to set of rational numbers .

Inclusion and subsets :



Write ‘a subset ‘ or ‘not subset ‘

a. set of integers is …………of set of counting numbers.

b. set of natural numbers is ………..of set of integers .

c.set of counting numbers is ………..of set of rational numbers .

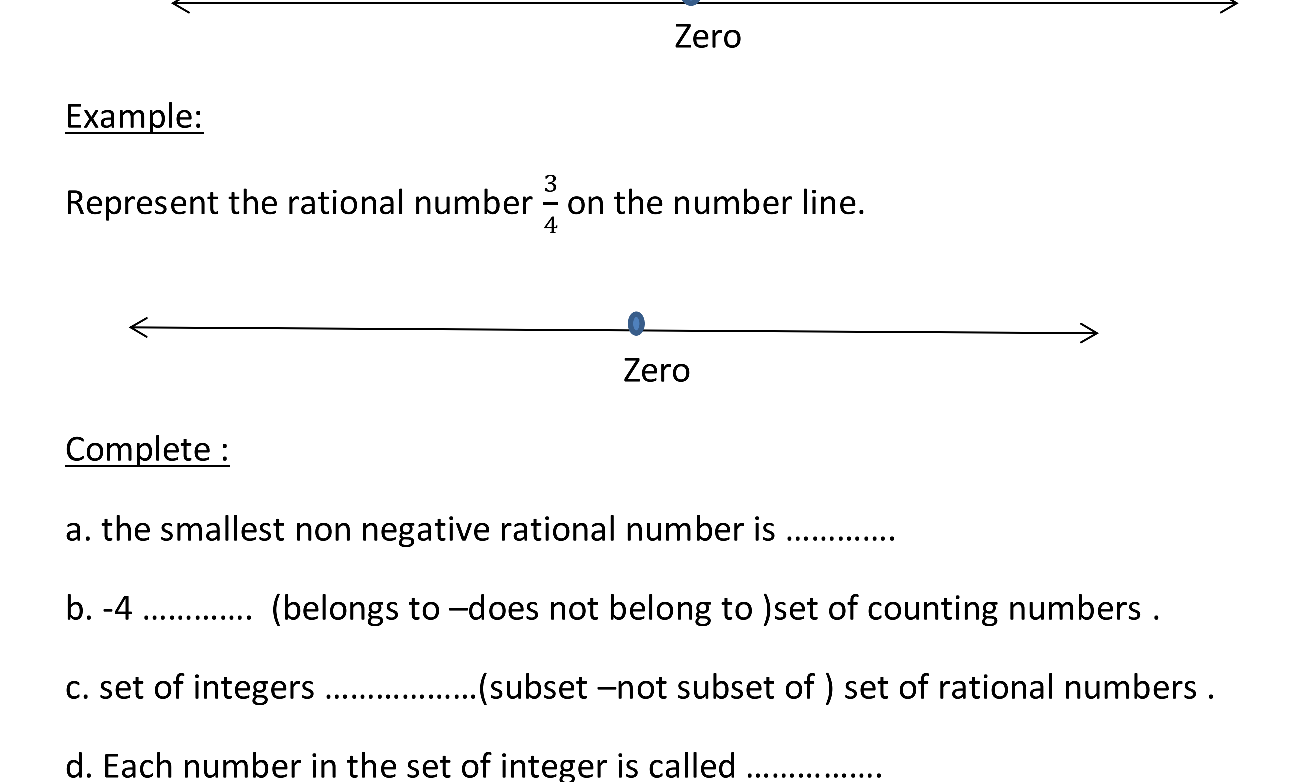
d. set of rational numbers is ……………..of set of natural numbers .



Representung the rational number on the number line :

.Each rational number can be represented by a unique point on the number line .

. the positive rational numbers are represented on the number line by points lying on the right side of the point which represents the number zero and and the negative rational numbers are represented by points lying on the left side of the point which represents the number zero and the number zero neither positive nor negative.



Example:

Represent the rational number $\frac{3}{4}$ on the number line.

Complete :

a. the smallest non negative rational number is ....

b. -4 .... (belongs to –does not belong to)set of counting numbers .

c. set of integers ....(subset –not subset of) set of rational numbers .

d. Each number in the set of integer is called ....



lesson 4: comparing and ordering rational numbers.

If the point which represent the number x lies on the left of the point which represent the number y on the number line as shown in the opposite

figure ,then: $x<y$ or $y>x$



x y

Example :- Represent the following rational numbers on the number line , then arrange them ascendingly : $\frac{7}{5}$, zero , $\frac{9}{5}$, 2, -1

-Represent the following rational numbers on the number line , then arrange them ascendingly : 2, zero , $\frac{5}{2}$, -1, $\frac{7}{2}$

Compare the two numbers in each of the following using suitable sign (< . > ,=).

a. $\frac{5}{12}, \frac{7}{12}$ b. $\frac{6}{12}, \frac{2}{3}$ c. $\frac{11}{12}, \frac{11}{15}$

d. $\frac{2}{3}, \frac{4}{5}$ e. -4 , -4.1 f.3.7 , 3.15

g. $\frac{11}{2}$, 3.2 h. $\frac{1}{4}$, -$\frac{5}{6}$

Compare each the following using suitable sign (< . > ,=).

a.$\frac{3}{6}$ ………… $\frac{2}{3}$ b. -$\frac{7}{5}$ ……….$\frac{4}{5}$ c. $\frac{1}{5}$ …….. $\frac{1}{6}$

d. $\frac{4}{10}$ ……….$\frac{14}{35}$ e. $\frac{10}{15}$ ……. $\frac{2}{3}$ f. -$\frac{3}{4}$ …….. -$\frac{2}{4}$

Write the correct sign (< ,> , =).

a. -$\frac{1}{2}$ …….. zero b.0.8 …….. 1 c. – 1.6 ……….. -$\frac{8}{5}$

d. 3.7 …… 3.65 e. $\frac{3}{2}$ …….. $\frac{1}{2}$ f. $\frac{1}{4}$ ……….. $\frac{1}{6}$

g.-4$\frac{1}{2}$ ……… -5 h.-$\frac{5}{7}$ …….-$\frac{3}{2}$ i. 0.5……… $\frac{2}{8}$

j .3$\frac{1}{2}$……… 3.5 k.-$\frac{3}{4}$ ……… $\frac{1}{4}$ l. 1$\frac{2}{3}$ ………. 1$\frac{4}{5}$



Order rational numbers order the given set numbers from least to greatest, using a table like the one shown.

2.1	1.4	$-3\frac{1}{4}$	$-1\frac{7}{8}$	$-2\frac{1}{2}$

Least			greatest
……………..	……………….	……………..	………….

.order the given set of numbers from greatest to least ,using table like the one shown .

3.4	$-2\frac{1}{2}$	0	$-1\frac{3}{7}$	$3\frac{1}{4}$

greatest			Least
……………..	……………….	……………..	………….



Choose the correct answer.

1) $\frac{3}{5}$ ………… $\frac{2}{7}$

a.> b.< c.=

2) 0.7 ……….0.65

a.> b.< c.=

3) $-\frac{1}{4}$ ……….. $-\frac{2}{9}$

a.> b.< c.=

4) $\frac{2}{8}$ ……….0.5

a.> b.< c.=

5) ……….is lying between 3.14 and 3.2 .

a.3.15 b.3.21 c.3.22 d.3.20

6) 2.8 > …………

a.3.1 b.4 c.-5.8 d.7.9

7) the smallest number from the following is ……….

a.0.11 b.0.3 c.0.101 d.$\frac{1}{2}$

8) the greatest number from the following is ……….

a.$\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{1}{4}$ d. $\frac{1}{12}$



Lesson 5&6 :- Exploring Absolute value

- Comparing Absolute values

- what is the absolute value ?

The absolute value of a rational number is its distance from zero since distance is positive , or zero .

$|5|$= 5 and $|-5|$ =5

Note - $|-5|$ = -5

Find the value of each of the following :

a. $|-4|$

b. -$|4|$

c. $|0|$

d. - $\left|-\frac{3}{7}\right|$

e. $|-3|$ + $|5|$

f. $|-6|$ -$|6|$

compare using (<, >, =)

a.$|-7|$ ……….. $|-11|$

b. -5 ………. $|-2|$

c. $|-2.4|$ ………..$|-2.40|$

d. $\left|-3\,\frac{1}{7}\right|$ …………$\left|-3\,\frac{1}{5}\right|$

e. $|-2|$ ………… $|-7|$

f. $|-2.8|$ ……….. -2.8



Find the value of each of the following :

a. $|-7|$ ....

b. $|-3| + |5|$ ....

c. $|-5| + 7$ ....

d. $|-5| - 5$ ....

e. $|-30| \div |-5|$ ....

f. $|-2| + |-13|$ ....

g. $|-12|$ - $|12|$ ....

h . $|-3| \times |-5|$ ....

I. $|0| \times |-3|$ ....

J . $|-100|$ - $|-50|$ ....

k. $8 \times |-11|$ ....

L . $|-10|$ - $|2|$ ....

Compare using [< , > or =] .

a. $|-3|$ .... $|-1|$

b. $|-4|$ .... $|-3|$

c. -1.4 .... $|-1.4|$

d. $\left|9\,\frac{3}{5}\right|$ ....$\left|-9\,\frac{3}{5}\right|$

e. $5\frac{5}{6}$ .... $\left|-\frac{35}{6}\right|$

f . $|-2.71|$ 2.7



Find the value of x :

a. $|x|$ =5

b. $|-4|$ =x

c . $|x|$ = 12

d $|3|$ = x

e. $|x|$ = 0

f . $|-101|$ =x

g. $|-12|$ =x

h . $|x|$ = 20

choose the term that correctly completes the sentences :

$|2| = |-2|$		
absolute value	distance	direction
equal	negative	positive

a. The ……… symbol in the expression $|2|$, signifies the distance from 0 to 2 .

b. The ……… symbol in the expression $|-2|$, signifies the distance from 0 to- 2 .

c. The ………. Sign shows the relationship between each side and that their values are the same …………..from 0 .



choose the correct answer

1) $|-7|$ > ……………

a. $|-6|$ b. $|-7|$

c. $|-8|$ d. $|-9|$

2) $|-1.34|$ < …………………

a. 1.4 b. -1.29

c. -1.4 d. 1.19

3) $\left|-3\frac{1}{4}\right|$ …………. 3.12

a. > b. <

c. =

4) the absolute values of opposites are ……….

a. equal b. different

c. negative

5) A negative number with an absolute value greater than 10

a. 10 b. 11

c. -9 d. -12

6) The distance between 10 and $|-10\ |$ on the number line is ………… unit[s]

a. 10 b.-10

c. 0 d. 20

7) The absolute value of the opposite of $-2\frac{1}{5}$ is ……………..

a. $4\frac{2}{5}$ b. 0

c. $-2\frac{1}{5}$ d. $2\frac{1}{5}$



8) $|2| \times |-2|$ = …………….

a. 0 b. 4

c. -4 d. -1

9) $|x|$ …….. -1

a.> b. <

c. =

10) $\left|-2\frac{1}{4}\right| \div \left|\frac{1}{2}\right|$ =

a. $4\frac{1}{4}$ b. $4\frac{1}{2}$

c. $\frac{9}{8}$ d.4

Write the opposite (additive inverse) number of each of the following:

a. $\frac{3}{7}$ ………… b. - $\frac{2}{5}$ …………. c.0 …………

d. $\frac{1}{2}$ ………… e. - $\frac{3}{2}$ …………. f .2 $\frac{1}{3}$ ………….

Represent each of the following rational number on the number line :

a. $\frac{1}{3}$ b.- $\frac{1}{2}$ c. 3 $\frac{1}{4}$ d.-2.5

Revision on unit 2

Choose the correct answer :

1) the rational number between -3.1 and -3.17 is ……………

a.-3.2 b. 3.15 c. -3.14 d. -3.18

2) which of the following is greatest number ?

a. -10 b.|-10 | c. -11 d. 9

3) the additive inverse of |-2| is ………….

a. 2 b. -2 c. $-\frac{9}{3}$ d. $-\frac{12}{4}$

4) |-3| + |-2| =…………

a .5 b.-5 c. 6 d.0

5) All integers are also ………..numbers .

a. counting b. natural c. rational

6) -3 …………………set of natural numbers .

a. belongs b. does not belong c. is a subset of d. is not a subset

7) the set of counting number numbers …………….te set of rational numbers

a.belongs b. does not belong c. is a subset of d.is not subset of

8) |-8| > ………..

a.|-9| b. |-7| c.9 d. 8

9) the best subset for of the number -2 is …………

a. acounting number . b. an integer

c. a natural number . d. a rational number

10) the smallest natural number is ………….

a. -1000 b. -1 c. 0 d. 1



11) the integer which comes just before -3 is ……….

a.-2 b. -4 c. -1 d. 0

12) The opposite number of - $\frac{3}{8}$ is …………….

a. - $\frac{3}{8}$ b . $\frac{8}{3}$ c . - $\frac{8}{3}$ d. $|-\frac{3}{8}|$

13) - $\frac{3}{4}$ ……………. - $\frac{1}{2}$

a. > b . < c. =

14) which of the following is an integer ?

a. 3.75 b.- $\frac{3}{7}$ c. $\frac{7}{7}$ d. $2\frac{1}{2}$

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complete the following .

a) the smallest positive integer number is ………

b) absolute values of the opposite are ………….

c) |-3| x |-4| =…………

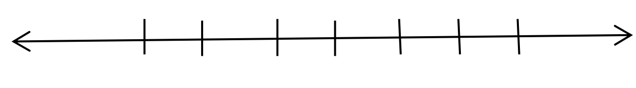
d) the number of integers between -5 and 2 ……………….

e) $-3\frac{1}{4}$ in the form $\frac{a}{b}$ is ………….

f) the integers between -4 and 1 are ……………

g) A negative number with an absolute value greater than 8 is …………

i) from the opposite number line the integer for point A is ……..and its opposite is …………………………



-1 0 3





Answer the following questions .

1) -8 , |-7| , 2 , 0 , -5

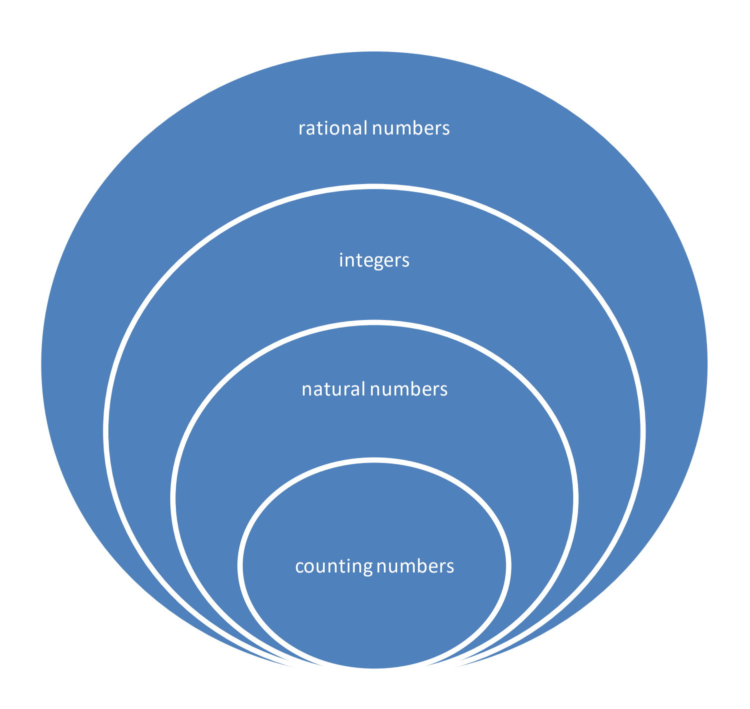
The order is :……………………………………………………………………

2) find a rational number lying between $\frac{3}{5}$ and $\frac{2}{3}$

…………………………………………………………………………………………………..

3) write the following numbers in the opposite venn diagram.

34 , $2\frac{1}{4}$, 0.225 , -10 ,0 , -$\frac{7}{8}$



4) Represent -$3\frac{1}{4}$ on the number line .

……………………………………………………………………………………………….



UNIT 3
ALGEBRAIC EXPRESSIONS

Lesson one : Creating mathematical expressions

Mathematical expressions are sorted into:

Numeric expressions

Are statements that contain only numbers separated by one or more operations from (+ , − , ×, ÷)

Examples : 3 + 5.8

Algebraic expressions

Are statement contain numbers and symbols (variables) separated by one or more operations from (+ , − ,×, ÷)

Examples :3X + 4Y

1) Classify the following mathematical expressions.

Mathematical expression	Algebraic expression	Numeric expression
9		
2 + 7.8		
3(6) + 2		
7(1.4 + 3.2)		
48 – 1		
$\frac{1}{4}$ m – 2		
2n		
3P + 4q		
5X + 3X – 1		
X – 36		
R + s – t		



2) *Write numeric or algebraic expression for each of the following :*

a) 8 K + 7 –1 (……….…….……..)

b) 89 (……….…….……..)

c) $\frac{3}{4}$ z (……….…….……..)

d) 7 – 5 + 3 (……….…….……..)

e) 26 – 6 + 8 (……….…….……..)

f) 3a – 4b + c (……….…….……..)

g) 3x – 2x + 3 (…………………..)

h) 6 (5 – 3) + 2 (……….…….……..)

H.W

Mathematical expression	Algebraic expression	Numeric expression
12 + 5.8		
3K + 4		
8(1.4 – n)		
2(3) + 5		
3p – 4q + 1		
K + 3m –n		



Lesson two : Analyzing mathematical expressions

Contents of mathematical expression:

Term: Is a number, a variable or product of both 2 , 5X , 8 , 3Z , $\frac{3}{4}$ b , $\frac{5}{7}$

Constant: Is the term that doesn't contain variable 2 , $\frac{2}{5}$

Coefficient: Is the number that is multiplied by the variable like 5 in (5X)

Like terms All numerical terms are like 2, 8 , $\frac{3}{7}$

Algebraic term of the same variables are like 3X, 5X ,9X

1. **Complete the following table :**

Expression	Number of terms	Like terms
5		
8 + 2		
X + 12		
4n + 2n + 2		
6 + 3X + 3		
M + 3 +2n + 2		
16X + 2X		
8z + 3z + 9		
7X + 7X + 1 + 2X		





2. **Complete the following table**

Expression	Constant	coefficients
2a + 7 + 4a		
17 + 5 + x		
4x + 7x + 9		
22 + $\frac{1}{3}$z +2y		
0.2q + 0.6r + 2y		
4a		
3		

3. **Complete the following table**

Expression	Number of terms	Like terms	constants	coefficients
7a – 4b + 7				
X + X + 4X				
6 – Z + 5				
18				
$\frac{1}{2}$ n – 2n + K				
0.4a + 0.1a + 2a				
R				



H.W

Expression	Number of terms	Like terms	Constants	Coefficients
25n				
4n – 5 + 6n				
8z + g + z				
1000				
2m + 5				
K + 3 + 4k				
7				
$\frac{4}{5}$ b +5q – 7h				
8a				
3 + 5				
2 x 4				





Lesson three : Writing Algebric expression

Algebraic expression and written (verbal) expression

Addition	Subtraction	Multiplication	Division
• Add • Sum • Increased by • More than • Exceeds • Total • Plus • In all • Gain • deposit	• subtract • difference • decreased by • fewer • diminished by • minus • Take away • Withdraw • Reduced by • Less than • Magnitude of increase	• Multiplied by • Times • Product of • Double • Triple • twice	• Divide • quotient • per • divided equally • split into • fraction • ratio of • half • third

A. Write each of the mathematical expression using Verbal form (words):

1) X + 2

2) $\frac{12}{X}$

3) X – 5

4) 12x

5) XX

6) 2m + 7

7) 3(m+4)

8) 2(X + 5)

9) 8 – 3n

10) $\frac{1}{2}$b + 15



B. <u>Select the algebraic expression that represent the verbal expression</u>

Twelve less than three groups of y 3Y – 12

1) 12 – 3Y
2) 3Y – 12
3) Y – 3 (12)
4) 12(3) - Y

C. <u>Record all verbal expressions that represent the expression 5 + 2X</u>

1) The sum of 2 and 5 multiplied by X
2) The product of 7 and X
3) The sum of 5 and the quantity 2 times X
4) The product of 2X and 5
5) The sum 2 times X and 5

D. <u>Record which expressions can be represented by an algebraic expression that contains addition.</u>

1) Take 14 away from a number
2) Ammar has 7 more tokens than Tamer
3) A number increased by 3.5
4) Baher put 12 more stickers in the sticker book
5) A student shared his oranges equally with his 2 friends

FUTURES EDUCATIONAL SYSTEMS

E. **Write an algebraic expression for each of the following verbal expression.**

1) Add 6 to the number Y
2) Subtract 3 from the number X
3) Multiply 5 by the number Z
4) Divide the number n by 3
5) A number less than ten
6) A number less ten
7) A number less than six
8) A number less six
9) Nine more than a number X three times a number S
10) Product of a number X and 5.4
11) Quotient of a number v by 6
12) Three fifth a number m
13) Nine increased by a number five
14) A number Y decreased by 5
15) Add 3 to double of the number X
16) Subtract 5 from double of the number y
17) Twice the sum of a number and 3
18) The sum of four times a number and seven
19) Add 6 to one third of a number
20) 8 decreased by three times a number



F. Choose the correct answer

1) If we subtract 5 from the number X we get

a) 5X b) 5 – X c) X – 5 d) X + 5

2) Suzan saved L.E X and her father gave her L.E 10 she will have

a) X – 10 b) X + 10 c) 10X d) 10 – X

3) Subtracting 3 from double a number =

a) N – 3 b) 2n – 3 c) 3n + 2 d) 5n

4) Three times a number less two is

a) 3X + 2 b) 3X – 2 c) 2 ×3X d) 2 + 3X

5) If three times a number is added to 12, then the algebraic expression that express this is

a) q + 12 b) q – 12 c) 3q + 12 d) 3q – 12

6) Twice the sum of a number and five is ……

a) 2Y + 5 b) 2Y – 5 c) 2(Y + 5) d) 2(Y – 5)

7) Bassem is K years old now,how old will he be after 5 years?

a) 5K b) 5 ÷ K c) K – 5 d) K + 5

8) What operations are in the algebraic expression for "twice a number increased by three"?

a) + and – b) X and – c) X and + d) + and –

9) What verbal expression for 5X – 7 is ..

a) 5 multiplied by X increased by 7
b) 5 times a number X, lesss than 7
c) 5 times a number X, less 7
d) 7 decreased by 5X

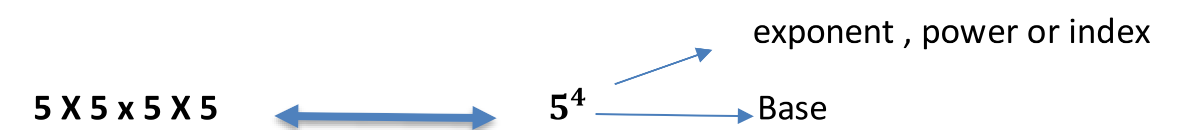


10) The verbal expression for 3(Y + 4) is

a) Three times Y is increased by 4
b) The sum of Y and three times 4
c) Y less 4 multiplied by 3
d) The product of 3 and the sum of Y and 4

Lesson four : Ordering of operations and exponents

- ***Repeated multiplication (Exponent)***



1. Describe what the expression 9^2 represents by answering each of the following :

a) What is the base?

b) What is the exponent?

c) What is the simplified value and how did you find it ?

2. Describe what the expression 2^3 represents by answering each of the following :

a) What is the base?

b) What is the exponent?

c) What is the simplified value and how did you find it ?

3. Complete the following table :

Base	Exponent	Exponential form	Expanded form	Simplest form
5	2			
		3^3		
			2 X 2 X 2 X 2X 2	
4				
				9



4. Complete the following table :

a) Three cubed = …………..

b) 5 squared = ………………

c) 9 to the power 4 = …………………

d) 5^3 = ………………………

e) 2 X 2 X 2 = $2^{\dots\dots\dots}$

f) 6 X 6 X 6 X 6 = … … . $^{\dots\dots\dots}$

g) a X a X a X a X a = … … … . ^{5}

h) 5 cube = ……………

i) 9^2 = …………………

j) 7 to the power 4





- ***Ordering of operations and exponents***

First: Do operations inside parentheses.

Second: Exponents

Third: Multiply & divided from left to right

Fourth: Add & subtract from left to right.

4. <u>Use order of operations and exponents to simplify the following expressions:</u>

a) $13 - 7 + 8 \times 9 + 63 \div 7$

....

....

b) $9 \times 4 + (12 + 2) - 30 \div 3$

....

....

c) $4(3 + 2 \times 3) - 5^2$

....

....

d) $(15 - 9) + 3 \times 4^2 \div 2$

....

....

e) $4 \times (12 \times 6 - 4^2) + 9$

....

....

f) $(8 - 6 \div 2)^2 + 3 \times 4$

....

....

g) $10 + (6^2 - 12)$

....

....



h) $(10 + 43 - 5) \div 2 + 10$

………

………

i) $(6 + 3)^2 + (9 - 10 \div 5)$

………

………

j) $(13 - 5) \times 3 + 7 + 16 - 8$

………

………

Lesson five : Evaluating algebraic expressions

Lesson six : Applications algebraic expressions

1. Evaluate each algebraic expression for the given value of the variable:

a) $16 - X$ at $X = 5$

………

………

b) $15 + 3b$ at $b = 2$

………

………

c) $7K - 15$ at $K = 6$

………

………

d) $4 \div n + 15$ at $n = 2$

………

………



e) 3n – 2 for n =7

……..

……

f) $2x^2 - (3 \times 4 + 2^3)$ at X = 5

……..

……

g) 4(m – 9) + 5 at m =16

……..

…….

h) $4^2 + 5\ (b^2 - 3)$ for b = 2

……..

……

i) $5h^2(6 - 4)$ for h = 3

……..

……

j) $9 + (p^2 - 3) \div 2$ for p = 5

……

……



2. Which of the given orders of operations would you use to evaluate the expression

7 +6 (t^2 – 3) for t = 4 ? select the appropriate order

a) Multiply , simplify exponent , subtract , add

b) simplify exponent , subtract , multiply , add

c) add , multiply , simplify exponent , subtract

d) simplify exponent , add , subtract , multiply

e) simplify exponent , multiply , add , subtract

H.W

Choose the correct answer:

1) The value of the expression 3n – 2 for n = 7 is ………………

A. 14 B.19 C.21 D.23

2) The value of the expression $2x^2$ –(3 x 4 + 2^3) = ……….. at x = 5

A. 50 B.40 C.30 D.35

3) 8 – 3 x 2 ÷ ($4-2)^2$ = ………………

A. 2.5 B.1 C.0.5 D.6.5

4) Which of the following does not equal 27 ……………..

A. 3^3 B. 5^2+(30-4x7) C. 2^4+3x5-4 D. 2^5+5

5) Two cubed added to five squared equals ………………

A. 2x3+5x5 B. 3^2 + 2^5 C. 2^3 + 5^2 D. 2^3+5^4



Lesson seven : Determining equivalent algebraic expression

Evaluate each of these expressions using two different positive integers of your choosing :
If the expressions are equal,answer yes.If they are not equal, answer no.

	3 (2X + 1)	6X + 3	Equal ?

	3X + 6	X + 3 + 2(X + 1)	Equal ?

	4X + 6	3(X + 2)	Equal ?



H.W

Evaluate each pair of the algebraic expressions at the given value for the variable and determine where the two expressions are equivalent or not.

The value for x	5x + 3	3(x + 4)−5	Result
If x = 3			
If x = 2			

The value for x	7 + 3x	4 + 3(x + 1)	Result
If x = 4			
If x = 7			

The value for x	4x + 5	4(x + 5)	Result
If x = 1			
If x = 6			



Revision for unit three

Choose the correct answer:

1) Number of terms of the expression $3x + 2y - 5$ is ………………
   A. 2 B. 3 C. 4 D. 5

2) Which of the following is like terms?
   A. 5 , 7 B. 2X , X^2 C. 5a , 5b D. m^2, n^2

3) Volume of a cube of edge length 5 cm is …………. cm^3
   A. 6×5 B. 25 C. 5^3 D. 5^2

4) Which of the following expression has the same value of 3X + 5 at X = 3
   A. 3(X +1)+5 B. 4X+1 C. 5X+3 D. X^2+5

5) The coefficient in the expression 6 – 3 + 5X is………….
   A. 6 , 3 B. X C. 5X D. 5

6) Number of like terms in the expression 4a + 4b + 5 is ………………
   A. 3 B. 2 C. 1 D. zero

7) 5 cube = …………
   A. 5 x 5 B. 3^5 C. 5^3 D. 625

8) 5 times a number less 7 is …………………
   A. 5b + 7 B. 7 – 5b C. b^2 – 7 D. $5b$– 7

9) Subtract 8 from the number Kin algebraic form is …………
   A. 8 – K B. 8 + K C. K – 8 D. 8K

10) The first operation or exponent you perform in 3 X 5 + 3(2^3 – 5) – 4 ÷ 2
   A. Parentheses B. Plus C. Multiply D. exponent.

11) Adam has 50 L.E he bought 3 pens each for K L.E, then the remainder is
   A. 30 B. 3 + 50K C. 50 – 3K D. 50 + 3K

12) Take away twice the number K from 15 is written as ……….
   A. 2K – 15 B. 15 + 2K C. 15 – 2K D. 15 - K^2



13) The value of the expression 5 + (X^2 – 3) for X = 3 is ………..

A. 6 B. 11 C. 9 D. 12

14) 7 + 3 (…………… + 5) – 4 , complete to get a numeric expression

A. B B. K^2 C. 12 ÷ 2 D. X + y

15) In the algebraic expression : 5X – 4 +5m , the two like terms are ………

A. 3,5m B. 5x,5m C. 3,-4 D. 5x,3

16) The number of terms of the expression : 5 – 2m – 3m -+ 4 is ……….

A. 5 B. -2 C. -3 D. 4

17) The coefficient in the algebraic expression : 4X – 3 is ………………

A. 4 B. 4X C. -3 D. X - 3

18) Twice the difference of a number and 5 is …………….

A. 2y+5 B. 2y-5 C. 2(y+5) D. 2(y-5)

19) Malak saved n L.E and her mother gave her 5 L.E ,she will have …….L.E

A. n-5 B. n+5 C. 5n D. 5-n

20) Hana is x years oldnow,how old will she be after 6 years ?

A. x÷6 B. 6x C. 6+x D. X-6

21) 5 × 5 × 5 × 5 = …………..

A. 5×4 B. 5^4 C. 4^5 D. 20

22) The value of the expression X + 3^2 for X = 1 is

A. 7 B. 16 C. 10 D. $3+1^2$

23) The coefficient of the algebraic expression 4y - 3^2 is …………..

A. 4 C. 3

B. Y D. 2

24) Two cubed subtracted from five squared = ……….

A. 2×3+5×5 B. 2^5-3^2 C. 5^2-3^2 D. 5^2-2^3



25) The like terms in the expression : 2x+3y+3are ………….

A. 2,3 B. 2x,3x C. 3x,3 D. 2x,3

Complete the following

1) The constant in the expression 3y + 2x – 5 is ……………………………

2) The number of terms of the expression : 3 + 4z is ……………………

3) The verbal expression for 2m – 7 is ……………………………………….

4) The algebraic expression for a number less 7 is ……………………….

5) The first operation in the numerical expression : 4+ 3 ÷(5 - 1^2) is ………

6) 13 – 7 + $2^3 \times 3^2$ = …………………………

7) The two like algebraic terms 5 – 4x + $7^2$are ……………………………..

8) Five squared= ………………………………..

9) In the algebraic expression :5x - $3y^2$ + 4,the constant is ………………

10) The verbal form of the expression K – 5 is ……………..

Use the order of mathematical operations to simplify:

(17 -11) + 3× $2^4 \div 2^3$

40 +5(3^2- 7) +10

Evaluate the expression :

$5X^2$ + 8 ÷ (6 – 4) ÷ 2 at x=3



UNIT 4 : EQUATIONS AND INEQUALITIES

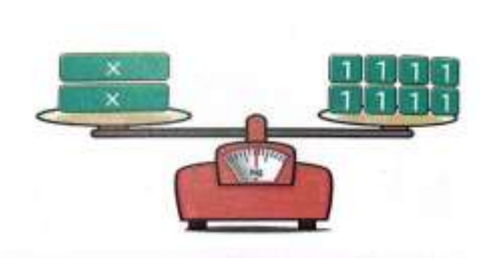
lesson 1 : solving Algebric Equations

Equations and solving equations

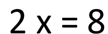
An equation is a mathematical sentence that uses an equal sign to show that two expressions have the same vaue .

Examples of equations :

$3 + 8 = 11$ $\quad$ $t + 6 = 14$ $\quad$ $-25 = b - 7$ $\quad$ $\frac{x}{2} = 6$







$2x = 8$ $\qquad$ $2x + 3 = 5$

Exercise 1 : in each of the following figures , write the equation and solve it.

a.

Equation : ____________

Solution : ____________

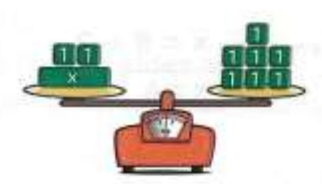
b.



Equation : ____________

Solution : ____________

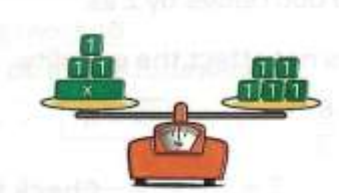
c.



Equation : ____________

Solution : ____________

d.



Equation : ____________

Solution : ____________



Exercise 2 : solve each of the following equations.

1) X + 4 = 9

……………………………………

6) M + 3 = 7

………………………………………

2) Y – 6 = 7

……………………………………

7) K – 4 = 10

………………………………………

3) 4 F = 24

……………………………………

8) 6 Z = 42

………………………………………

4) T ÷ 9 = 2

……………………………………

9) P ÷ 2 = 1

………………………………………

5) $\frac{Z}{5} = 3$

……………………………………

10) $\frac{R}{2} = 4$

………………………………………

Exercise 3 : complete :

1) If X + 6 = 11 , then X = ………………………………

2) 48 ÷ y = 12 , then y = ……………………………….

3) If K ÷ 8 = 9 , then K = ……………………………….

4) If A $+\frac{1}{2}$ = 3 , then A = ………………………………

5) if m – 11 = 16 , then m = ……………………………

6) if 3 y = 24 , then y = ………………………………….

7) if m – 4 = 11 , then the value of m = ……………………….

8) if k + 1 = 5 , then k – 3 = …………………………….

9) if x + x = 16 , then x – 3 = ……………………………….

10) if $\frac{1}{2}$ x = $\frac{2}{3}$, then $\frac{1}{3}$ x = ……………………………….

11) if $\frac{x}{3}$ = 4 , then twice x = ……………………….

12) if 6 y = 36 , then 5y = …………………..

13) if 9 + k = 44 , then k = ……………………

14) 3x = 27 , then x + 2 = ……………………

15) 48 = 4y , then y = …………………………………..



Exercise 4 : choose the correct answer :

1) if y – 3 = 10 , then y = ……………….

a) 19 b) 6 c) 13 d) 12

2) if z × 9 = 63 , then z = …………………………..

a) 7 b) 9 c) 8 d) 6

3) if 4 x = 12 , then 7 x = …………………………..

a) 7 b) 14 c) 21 d) 84

4) if $\frac{k}{8}$ = 7 , then k = ……………………………..

a) 15 b) 1 c) 56 d) 8

5) if 25 ÷ p = 5 , then p = …………………

a) 20 b) 5 c) 30 d) 1

6) if 3 x = 12 , then $\frac{1}{2}$ x = ……………………………….

a) 9 b) 6 c) 4 d) 2

7) a number if added to 17 the sum is 28 , then the number = ……………….

a) 11 b) 18 c) 45 d) 18

8) a product of number x and 6 is 42 , then x = …………………

a) 48 b) 36 c) 7 d) 6

9) paula bought 3 pens foe x L.E , each he paid 15 L.E , then x = ……………………

a) 5 b) 12 c) 18 d) 45

10) if x + x + x = 18 , then x = ………………………..

a) 9 b) 5 c) 3 d) 6



Lesson 2&3 : Exploring and solving inequalities

- an inequality is a mathematical sentence that contains $>$, $<$, $\geq$ or $\leq$.
- any number that makes an inequality true is a solution of the inequality.

Note that :

- The sign $\geq$ read as greater than or equal to.
- The sign $\leq$ read as smaller than or equal to.

Excersise 1 : name 3 solutions of each inequality then graph each inequality on a number line in the set of integer:

1) $c < 0$

………

2) $s \leq 2$

………

3) $a > -4$

………

4) $x \leq 4$

………

5) $y > 3$

………

6) $y \geq -2$

………..

7) $m < -3$

………

8) $k \geq 1$

………

9) $b > 4$

………

10) $y \leq 5$

………



Excersise 2 : name 3 solutions of each inequality in the set of rational number.

1) $x \geq 1$

……………………………………………………………………………………………………

2) $m \geq -2$

……………………………………………………………………………………………………

3) $y < -3$

……………………………………………………………………………………………………

4) $x \leq 2$

……………………………………………………………………………………………………

5) $p > 5$

……………………………………………………………………………………………………

6) $z < 0$

……………………………………………………………………………………………………

7) $z > 0$

……………………………………………………………………………………………………

8) $x < -2$

……………………………………………………………………………………………………

9) $k \geq 3$

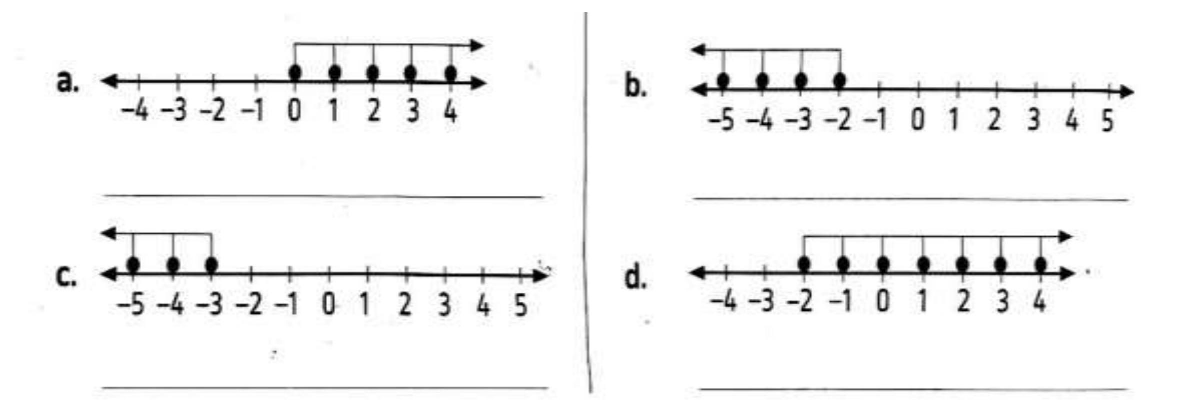
……………………………………………………………………………………………………

10) $x > 2$

……………………………………………………………………………………………………



Excersise 3 : write the suitable inequality that represented by the following number line in set of integers.



Excersise 4 : the sign shows the speed limit for a road in kilometer per hour.

Record all speeds that are acceptable to drive on the road.

a) 35 km/hour

b) a) 75 km/hour

c) 30 km/hour

d) 50 km/hour

e) 41 km/hour

f) 39 km/hour



Speed limit

Excersise 5 : the sign shows the sale prices of some clothing on a sale rack.

Record all prices that apply

a) 140.99 L.E

b) 180.99 L.E

c) 150.49 L.E

d) 290.99 L.E

e) 120.99 L.E

f) 150.99 L.E



Sale Prices



Excersise 6 : Record each true statement about the graphs of $x > -2$ and $x < -2$ in set of integers on the number line.

a) -2 belongs to the solution set of each of them.

b) -2 belongs to the solution set of only one of them.

c) the inequality $x > -2$ includes all values to the left of -2 on the number line.

d) the inequality $x < -2$ includes all values to the right of -2 on the number line.

e) they have no points in common.

Excersise 7 : Record each true statement about the graphs of $x > -2$ and $x \geq -2$ on the number line.

a) -2 belongs to the solution set of each of them.

b) -2 belongs to the solution set of only one of them.

c) the inequality $x \geq -2$ includes all values to the left of -2 on the number line.

d) the inequality $x > -2$ includes all values to the right of -2 on the number line.

e) they have no points in common.

Choose:

1) which of the following is a solution of the inequaity $m \geq -1$?

a) -2 b) -3 c) -4 d) 0

2) All of the following are solutions of the inequality $m < -3$ except …………..

a) -6 b) -10 c) -2 d) -5

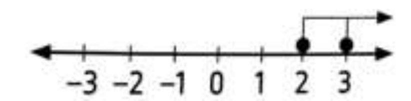
3) number of solutions of inequality $x > 5$ is ………………………..

a) 0 b) 1 c) 2 d) infinite

4) ………………….. is a solution of $x < 4$

a) 3. b) 4 c) 4.24 d) 5

5) ………………. Is a solution of the following graphed inequality.



a) -10 b) 00 c) 1 d) 10



Unit Test

Complete:

1) the smallest solution of the inequality $k \geq -4$ is ……………………

2) ………………… is a solution of the inequality $m < -6$.

3) Marwan read at least 5 books, then Marwan may be read ……………… books.

4) if $m - 4 = 6$, then $m =$ ……………………

5) If $x + 5 = 15$, then $x =$ ……………………

6) if $x + 5 = 15$, then $x + 2 =$ …………………

7) if $y - 2 = 10$, then $y + 3 =$ …………………

8) If $3y = 12$, then $y =$ ………………………

9) if $m + 3 = 5$, then $6m =$ ………………………

10) if $7x = 0$, then $100x =$ ……………………………

11) if $m - 3^2 = 1$, then $m =$ …………………………

12) if $x + 0.5 = 3$, then $x =$ ……………………

13) if $k + 1 = 5$, then $k - 3 =$ ………………………….

14) if $70 = 50 + t$, then $t =$ ……………………………….

15) if $11 - z = 11$, then $z =$ ……………………………

16) If $y + 3 = 9$, then $6y =$ ………………………………

17) if $3y = 24$, then $y - 2 =$ ……………………………….

18) if $t \div 2 = 7$, then $t + 2 =$ ………………………………

19) if $x + x = 16$, then $x =$ ……………………….

20) if $\frac{x}{3} = 4$, then twice $x =$ ………………………



Choose:

1) All of the following are solutions of inequality $x > -2$ except ………………

a) −1 b) −3 c) 0 d) 1

2) if $\frac{y}{3} = 7$, then y = ………………….

a) 3 b)14 c) 21 d) 30

3) mohamed has 47 L.E his friend Mina has less money than Mohamed, then Mina may has ……….L.E

a) 53 b) 47 c) 100 d) 19

4) Which of the following is a solution of the inequality $x \geq -5$?

a) −8 b) −7 c) −6
d) −5

5) A number is no more than 10 can be written as …………………

a) $n \leq 10$ b) $n < 10$ c) $n > 10$ d) $n \geq 10$



Unit 5

Dependent and Independent Variables

Lesson 1: The Relation Between Dependent and Independent Variables

Lesson 2 : Applications on Dependent and Independent Variables

Example 1 :

Complete these statement by filling in each blank with a given phrase to show depends on the other. You should all phrases to create three different dependencies.

What is the used material	**amount of water**
Your test score	**How expensive a cell phone**

…………………………… depends on how hard did you study.

Size of plant depends on ……………………………………… .

……………………..….. depends on ……..…………………... .



Example 2 :

For each of the following statements, decide which variable is (dependent) and which is (dependent).

a. How fast do you eat ? and How much are you hungry

………………..……………. …………………………..………..

b. What you bought ? and the cost you pay

………………………………. ……………………………………….

c. Your Blood pressure and the fast food

………………………………. ……………………………………..

Example 3 :

write each verbal phrase as an algebraic equation.

a. 8 more than f equals t ………………………………. .

b. k increased by 20 equals n ………………………………. .

c. y equals the sum of five and x ……………………………. .

d. four times c equals d ……………………………………….. .

e. m equals twice n increased by 15 ………………………… .

f. g equals the product of six and d ………………………. .

g. p equals the product of nine and r added to 37 …………. .



Example 4 :

use the following equations and complete the table.

Equations	Dependent variable	Independent variable
$b = 3a$		
$m = 5 + n$		
$r = p + 85$		
$L = 3k + 5$		
Equations	**Dependent variable**	**Independent variable**
$13 + 5e = f$		
$7x + 4 = y$		
$y = X - 4$		
$m = 7n$		
$A = 7 + b$		
$c = 4 + 7d$		
$y = 12 + x$		



<u>Lesson 3:</u> <u>Analyzing The Relationship Between Dependent and Independent Variables</u>

<u>Lesson 4 : Graph Representation for Dependent and Independent Variables</u>

<u>Example 1 :</u>

in the equation y=2x+1

x is the independent variable and y is the dependent variable and the values of the independent and dependent variables are expressed by the ordered pair (x , y)

let X= 0 → then y= 2(0) +1

= 0+1 =0

We express that by the ordered pairs (0,1,)

Let X= 1 → then y = 2(1) +1

= 2+1 = 3

We express that by the ordered pairs (1 , 3)

Let X= 2 → then y= 2(2) +1

=4+1 =5

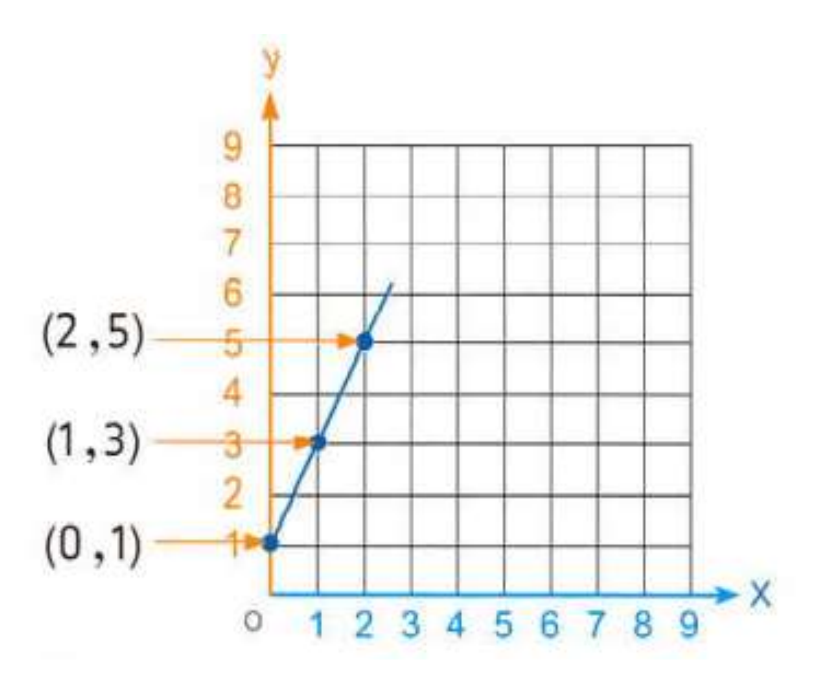
We express that by the ordered pairs (2 , 5)

And we can make a table

X	0	1	2
Y	1	3	5



And by graphing the ordered pairs on a coordinate plane.



Example 2 :

Evaluate each of the following for x = 5 .

a. $y = 3x$

……………………………………………………………………………

b. $y = x + 2.1$

……………………………………………………………………………

c. $y = 2x + 1$

……………………………………………………………………………

d. $y = \frac{1}{2} + x$

……………………………………………………………………………

e. $y = 4x + \frac{1}{4}$

……………………………………………………………………………





$\frac{1}{2} = 0.5$ $\frac{1}{4} = 0.25$ $\frac{1}{4} = 0.25$ $\frac{1}{5} = 0.2$

$\frac{1}{8} = 0.125$ $\frac{3}{4} = 0.75$ $\frac{3}{8} = 0.375$ $\frac{5}{8} = 0.625$

Example 3 :

Write an Equation. Use the variables x and y ,
Where x is the independent variable to evaluate y

a. The equation " Add 6 " , substitute if x = 4
………………………………………………………………………………………
…………………………………………………………………

b. The equation " Multiply by 2 " , substitute if x = 3.8
………………………………………………………………………………………
…………………………………………………………………

c. The equation " Multiply by 2 and add 3 " , substitute if x = 4.1
………………………………………………………………………………………
…………………………………………………………………

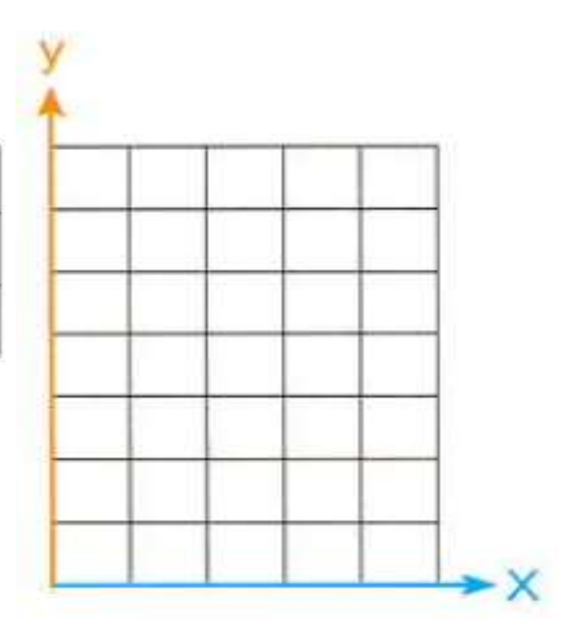


Example 4 :

Complete the following tables, then make the graphs.

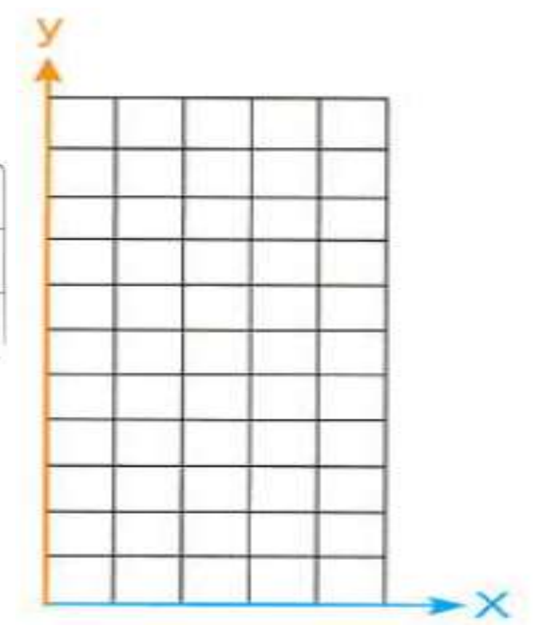
a. The equation : $y = x + 3$

x	0	1	2
y	____	____	____
(x , y)	(0, ___)	(1, ___)	(2, ___)



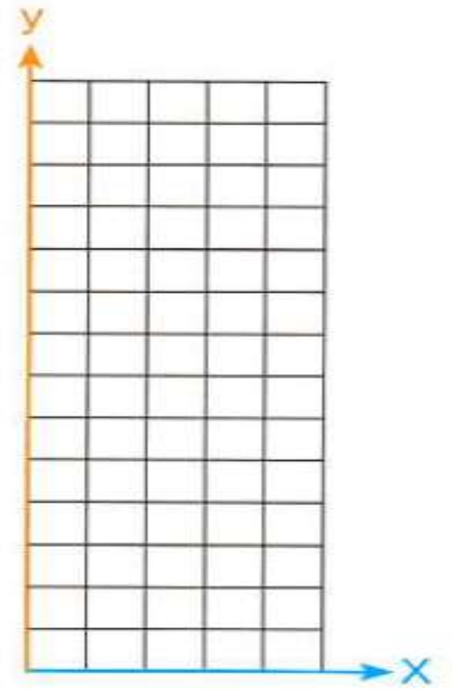
b. The equation : $y = 2x$

x	1	3	5
y	____	____	____
(x , y)	____	____	____





c. The equation : $y = 2x + 1$



x	0	2	3	5
y	....	....	....	....
(x,y)	....	....	....	....

Example 5 : use variables x and y to write the equation for each table.

a.

x	0	4	8	12
y	4	8	12	16

Equation : ………………..……………………………………

b.

x	12	20	8	4
y	7	11	5	3

Equation : ………………..……………………………………

Example 6 : Complete the following table according to the equation :

$y = 2x + 3$

x	0	4	8	10	13
y	....	....	....	....	....



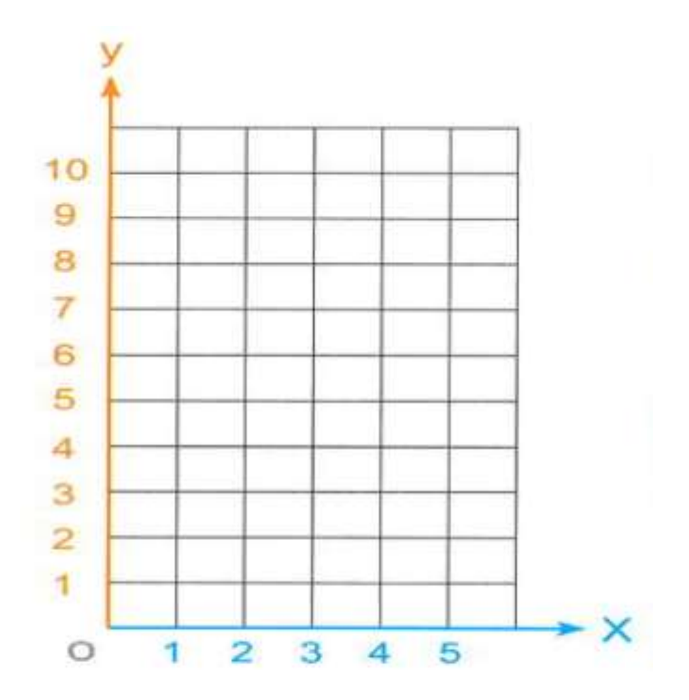
Example 7 :

Use the variables x and y , Where x is the independent variable to evaluate y. Write an Equation " Multiply by 2 and subtract 1 " and substitute x by 1 , 2 and 3 to evaluate y ,and record your results in a table ,then represent the table on a graph.

Solution

Equation: ………………………………………………………………………….. .

X	1	2	3
y			





Revision

a) choose the correct answer

1. In the equation; y=2+x if x = 3 ,then y would be…………
   a. 2
   b. 3
   c. 4
   d. 5
2. In the equation : x = 4y + 3 the dependent variable is……….
   a. X
   b. 4
   c. Y
   d. 3
3. "4 times t added to 7 equals k" in equation is …………..
   a. 7t+4=k
   b. 7k+4=t
   c. 4t+7=k
   d. 4k+7=t
4. In the equation : y= $\frac{1}{3}$ x , if the input is 12 , then the output is ……………….
   a. 15
   b. 9
   c. 36
   d. 4
5. The equation which represents the table

X	1	2	3
Y	3	5	7

Is ………………….

a. y=x+2
b. Y=2x
c. y = 2x+1
d. Y=$\frac{x}{2}$ + 2



b) Complete the following.

a. The ordered pair which satisfies the rule: y = x + 3 is (1 ' ………..)

b. The algebraic equation of "9 more than a equals b" is …………………….

c. The dependent variable in the algebraic equation : 3 m + 1 = n is ……………………………

d. 4^2-3x1+5= ………………………………………

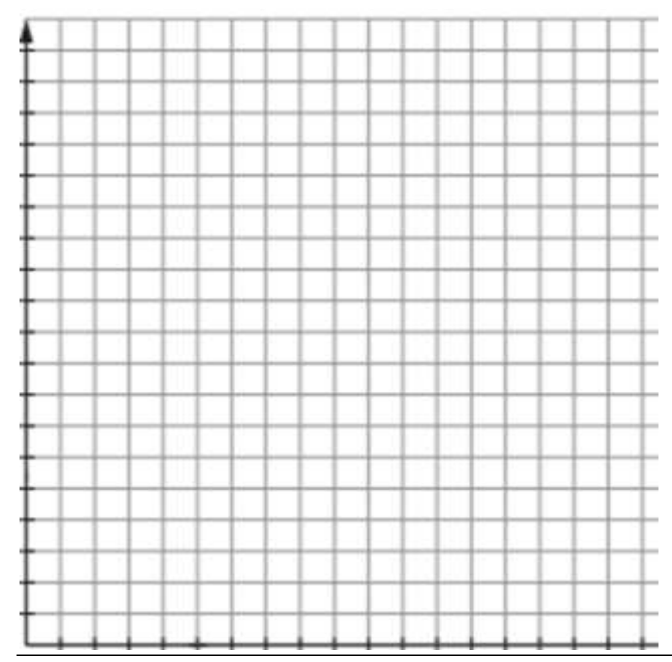
e. The best subset of 3 is ………………………. numbers

---

c) Complete the table which satisfies the equation :

y = 3x +1 and represent it

X	0	1	2
Y			
(x , y)			



---

d) Solve each of the following

a. x-4=|-2|

…………………………………………………………………………………………………

b. x÷5=7



Unit 6 : Data Distributions

Lesson 1: Data and Statistical Questions

Example 1 :

Identify which questions are

Statistical or Non Statistical

a. How tall are you? ……………………………………………

b. How tall are the students in your class? ……………………………

c. What time did you get up? ……………………………………………

d. What time did the students in your class get up? ……………………

e. What were the high temperatures in all of the Egyptian capitals today? …………………………………………………

f. Do you like the color red? ……………………………………………

g. What are the students' favorite colors? ……………………………

h. How many letter are in your name?

i. What are the heights of the players on the basketball team in your class? ……………………………………………

j. What is the name of your school? ……………………………………

k. How many emails do the students in the class write per week?

……………………………………………

L. How many books are on the bookshelf? ……………………………

m. How many people do each of the students in the class have in their families? ……………………………………………



Example 2 :

Determine whether the results from each question would give your
Numerical data **or** **categorical data.**

a. How many letters do the students in your class have in their first names?
……………………………………………

b. What are the favorite colors of students in your class?

……………………………………………

c. How many hours do the students in your class sleep at night?

……………………………………………

d. What types of movies do students in your class like best?

……………………………………………

e. What color eyes do students in your class have?

……………………………………………

f. What are the favorite sport of students in your class?

……………………………………………

g. How many people do the students in the class have in their families ?
……………………………………………

h. What TV shows do students in your class like?

……………………………………………

i. What are the scores on all of your math tests this marking period?

……………………………………………

j. How many pets do the students in your class have?

……………………………………………



<u>Example 3</u> : From the opposite Dot Plot answer the following questions:

a. Write a statistical question you have been asked to draw this dot plot.

…………………………………………………………

b. How many people were surveyed?

…………………………………………………………..

c. How many people saw 3 movies?

…………………………..………………

d. How many people saw 2 movies or more? ……………………..……

e. How many people did not see any movies? ……………………….…

f. How many people saw less than 3 movies? ………………………….

<u>Example 4</u> : From the opposite Bar Graph answer the following questions:

a. Write a statistical questions you have been asked to graph this bar graph.

……………………………………………….

b. How many students passed in math quiz ?

……………………………………..

c. How many subjects have at least 60 students passed the quiz?

……………………………………………..

d. Which subject has the lowest number of students passed the quiz?

……………………………………………………………………..

e. How many more students passed in social than in science?

………………………………………………………………………………………..



<u>Example 5</u> : What is the statistical question that the students
who collected the following data may have asked? and mention the type of this data.

Favorite color

Number of students

8 7 6 5 4 3 2 1 0

white black red blue

Colors

Number of meals each student eat per day

Number of students

8 7 6 5 4 3 2 1 0

1 2 3 4 5

Number of meals

Q: ………………………………

……………………………………

……………………………………

……………………………………

Q: ………………………………

……………………………………

……………………………………

……………………………………

The type : ………………………

……………………………………

The type : ………………………..

……………………………………

Number of family

0 1 2 3 4 5 6 7

Number of people

Q:

Number of siblings per student

0 1 2 3 4 5 6 7 8 9 10 11

Number of siblings

Q:

……………………………………

……………………………………



Lessons 2 Exploring the Histogram

Lesson 3 Representing Data Using Histograms

From the opposite histogram answer the following questions :



a. How many people are surveyed ?
b. What is the frequency in the hours interval [6 - 7]?
c. How many people in the hours interval [2 - 5] ?
d. Which hours interval has the maximum number of people ?
e. How many people spent watching movies 8 hours or more ?
f. How many people spent watching movies less than 4 hours ?

. Similar characteristics between bar graph and histogram : They have title and two axes, one of them horizontal to represent data and the other vertical [has a scale], tables for each axis and both graphs use bars to represent data. .



Difference characteristics between bar graph and histogram

bar graph	Histogram
Shows categorical data	Shows numerical data
The horizontal axis have data which can be anything	The horizontal axis included numerical intervals(classes)
Bars have equal space between them	No gabs between bars
Bars can be rearranged	Bars cannot be rearranged

The table shows data about the total times that 40 students spent using their mobile phones one week :

Time (hours)	2	3	4	5	6	7	8	9	12	13	14
Frequency	1	4	5	2	6	2	7	4	3	2	4

a. Form the frequency table using the intervals [2- 3,4- 5,6-7,.....) b. Draw histogram to represent this data.

The following data represents the weights of 24 children in kilograms.

12	30	27	15	27	21	16	33
14	22	15	21	13	23	26	24
22	28	34	15	14	16	21	27

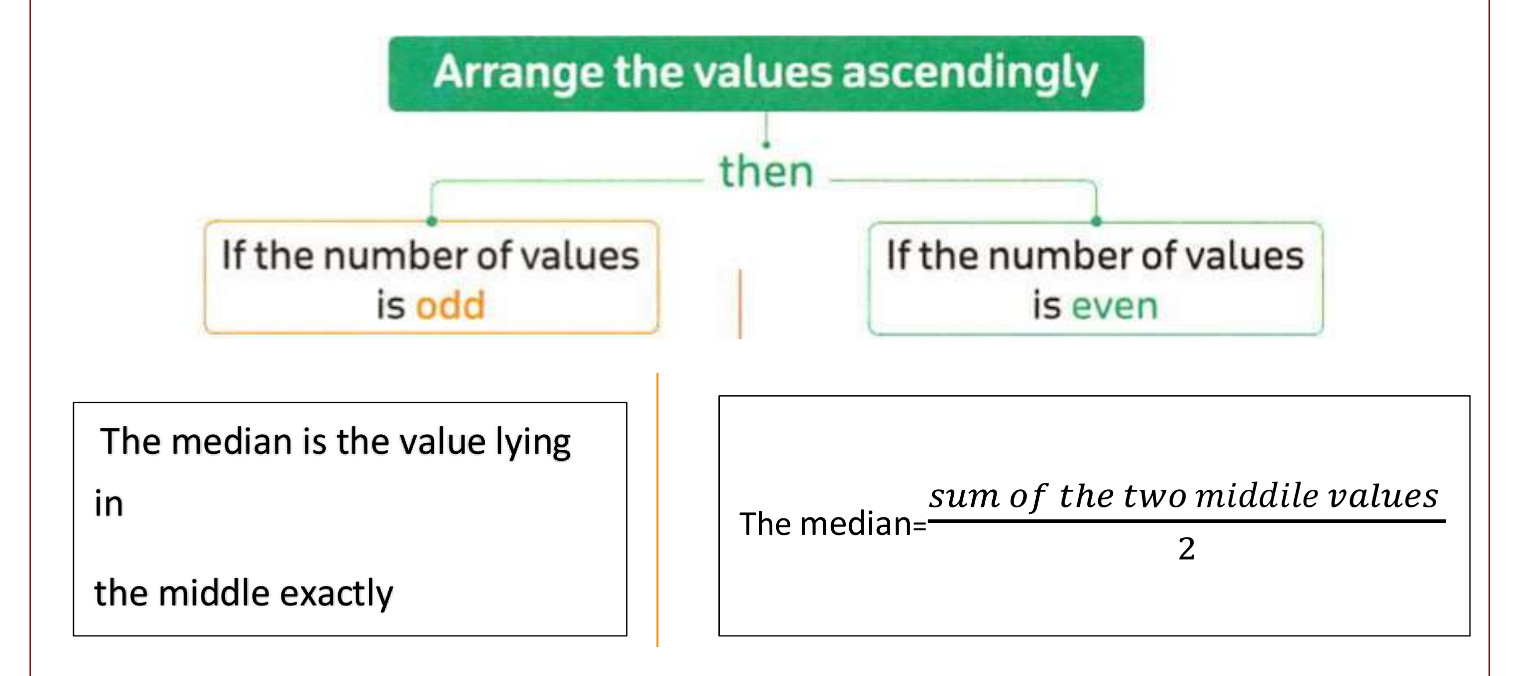
a. Form the frequency table.

b. Represent the data using histogram.



LESSONS4

To find the median of a set of values, do as follows :



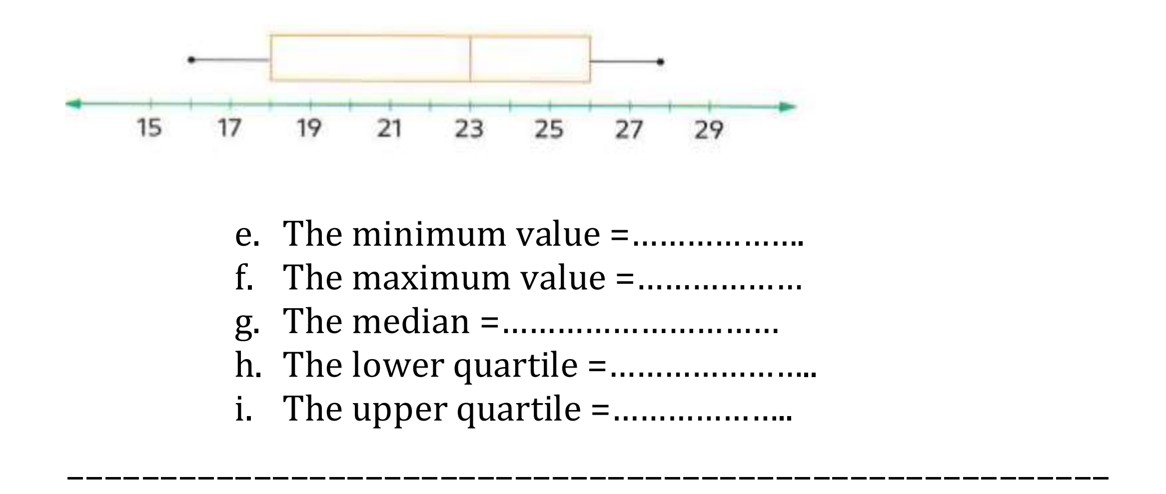
The median is the value lying in

the middle exactly

The median= $\dfrac{sum\ of\ the\ two\ middile\ values}{2}$

Example

c) From the opposite box plot , Complete:



e. The minimum value =……………….
f. The maximum value =………………
g. The median =……………………….
h. The lower quartile =…………………..
i. The upper quartile =………………..

—————————————————————————————————————





_ minimum value =…………… Maximum value=…………………

_ median =…………… Lower quartile =…………………

Upper quartile =……………………

---

2. find the median

a. 1 ,2,3 ,5 ,7

b. 1 ,2,3 ,3 ,5 ,7

c. 1,2,2,3 ,5,7

---

3. Write the five - number summary for each set of data

7 ,1 ,6 ,2 ,3 ,1 ,9

minimum=…….. Q1=………………..

maximum=………… median =……………… Q2=…………………

---

4. Draw the box p{.ot for each of the following data

5 ,7 , 13 , 11 ,2 , 1 ,2 ,14 ,16,10,3

min. =…………… max. =……………………………

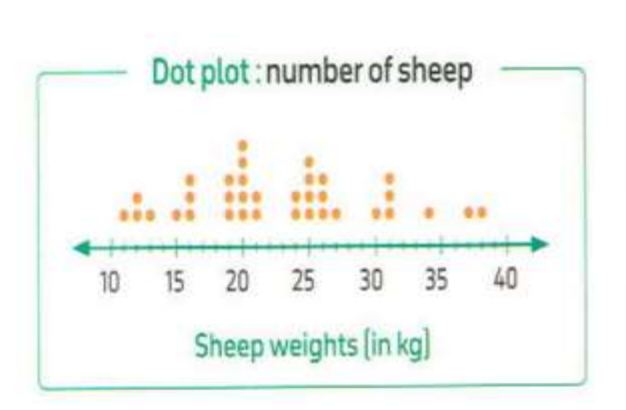
Median=………… Q1=…………… Q2=………………………

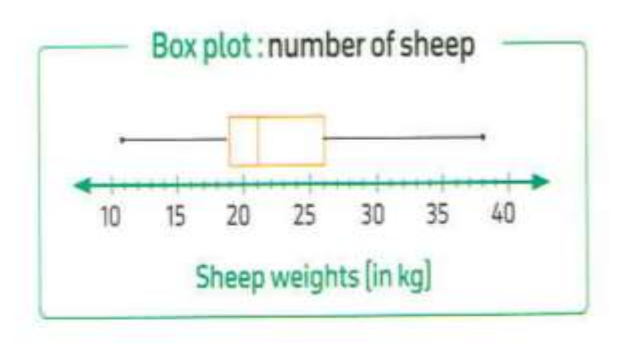


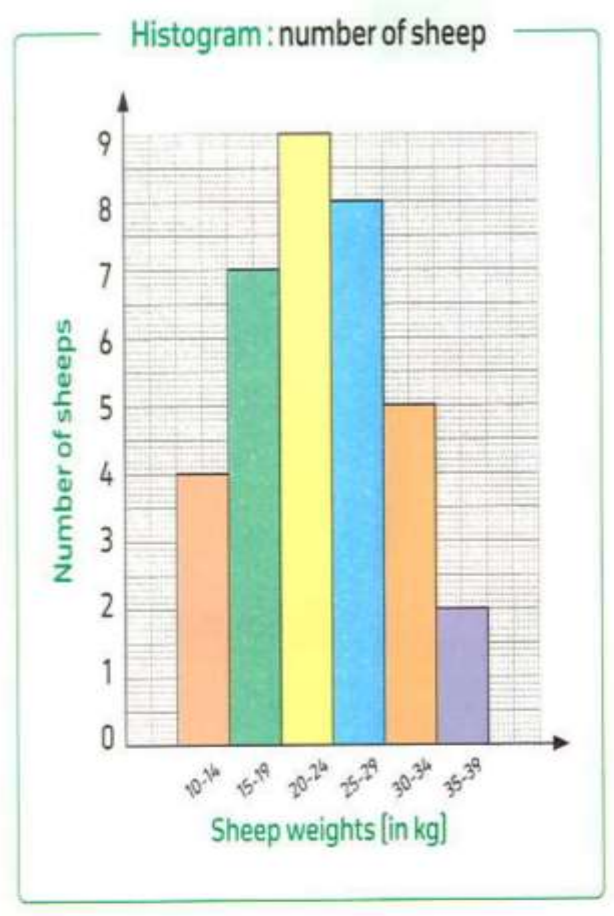
Lesson 5

Applications on Data Representation

if you collected data on the statistical question "what is the weights in kg of the sheep in a farm" and you graphed the collected data using different data displays as the following.







1. Use the previous graphs to answer the following questions :
   e. Which display can be used to find how many sheeps of weight 25 kg or more and less than 30 kg ?
   f. Which display can be used to find how many sheeps of weight 16 kg or more and less than 2l kg ?
      dot plot
   g. Which display can be used to find how many sheeps at least of weight 30 kg ?
      dot plot and histogram



h. Which display makes it easier to see that the median of sheep weight is 21 kg ?
 box plot.
i. Which display can be used to find the median?
 box plot and dot plot

j. Which display can be used to find the number of all sheeps ?
 dot plot and histogram.
k. Which display can be used to find the minimum weight?
 dot plot and box plot.
l. Which display can be used to find how many sheeps exactly of weight25 kg ?
 dot plot
m. Which display can be used to find the most common interval. for the sheep weight ?
 Histogram

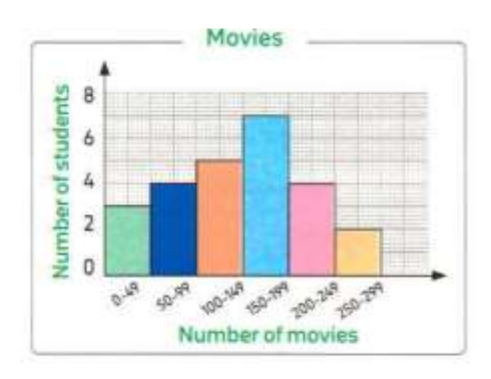
Exercise

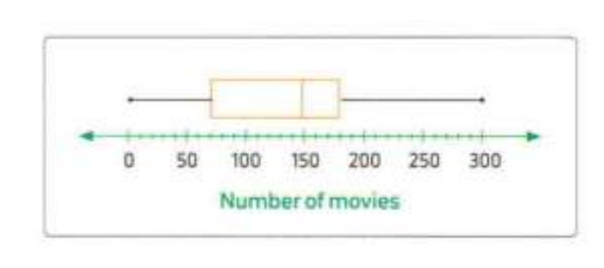
c. Label. each question with the type/ types of graph that would display the answer

Dot plot	Box plot	Histogram

a. The shape shows individual data ……………………
b. The shape shows the maximum value. …………………
c. The shape shows gaps and cluster. ………………..
d. The shape does not show the individual data. ……….
e. The shape shows the most frequent number. ……….

d. Hang collected data about how many movies on the Laptops with the students in his class and then created a histogram and a box plot to display the same data





Answer the question



a. Which display can be used to find how many students have 150 movies or more ?
……………………………………………………………………

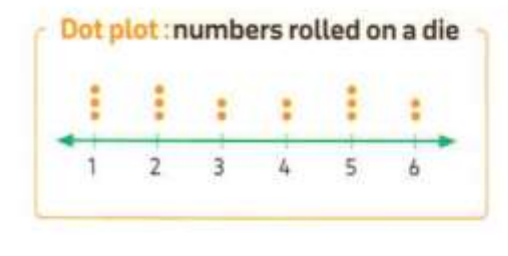
b. Which display can be used to find the minimum number of movies ?
………………………………………………………………………..

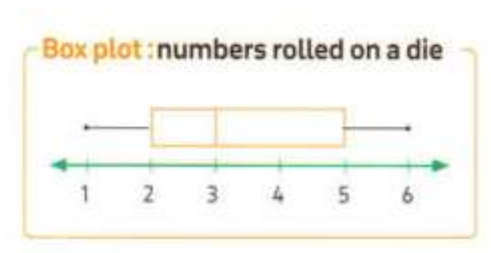
c. Which display can be used to find the lower quartile ?
………………………………………………………………………

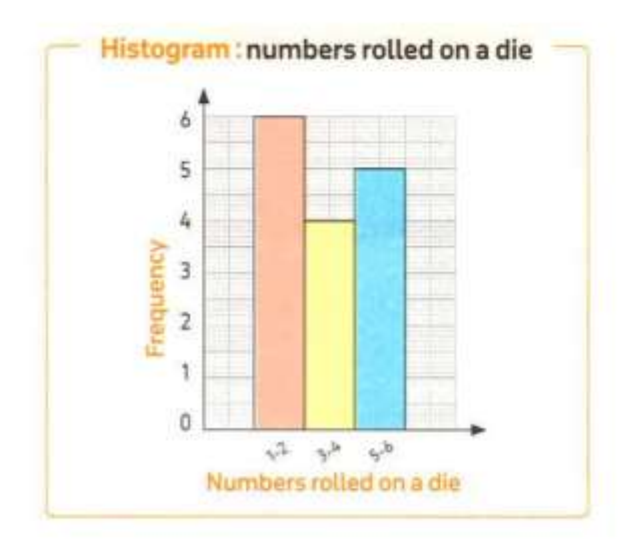
d. Which display can be used to find that there were 25 students at the class ?
…………………………………………………………………...

---

e. If you roll a die l5 times and the recorded results are '1 ,1 ,1 ,2 ,2 ,2 ,3 ,3 ,4 ,4 ,5 ,5 ,5 ,6 and 6' ,then you create a dot plot, box plot and a histogram to display the same data as the following.







A. Which display can be used to find lower quartile ?

………………………………………………………………………………………

B. Which display ca n be used to find how many times the number 4 is occurred?

………………………………………………………………………………………..

Which display can be used to find how many times the number 3 or more are occurred?



Unit 7

(lesson 1,2)Exploring the Balance of Data Sets interpreting Mean

FIRST. complete the following

a . The mean of the values 18 ,35 ,24 and 6 is ……………………..

b. The mean of the values 4 ,3 and 5 is …………………………………

c. The mean of the values 1, 2, 3, 3, 4 and 5 is………………………………

d. The average of the values 35, 50, 60 and 55 is…………………………

e. The average of the values 20, 20, 20 and 20 is……………………………..

F. lf the mean of the numbers 3, 5 and x is 4, then x =…………………………

G. lf the sum of five numbers is 30, and then the mean of these

numbers is………………………………………………..

SECOND .Calculate the mean (Average) by using the rule.

A) 4 , 6 ……………………..........

……………………………………

B) 3 , 4…………………………......

……………………………………………

C) 3 , 4 …………………………

……………………………………..

D) 6 , 10 ………………………….....

……………………………………..........

E) 1 ,3 ,5……………………..

....

F) 12 , 15 , 17 ,2 , 14.................

....

G) 18 , 6 ,18 …………………...

………………………………………

I) 19 ,8 , 3……………………………

……………………………………………

K) 9.6 , 2 .8 , 6.5……

……..…………………………………

m) 15.9 , 18.2 , 12.4 , 10.7 ……

………………………………………………



The mean of a set of numbers



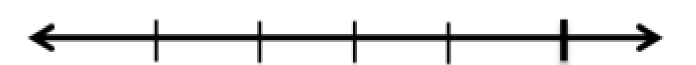
$$\text{Mean} = \frac{\text{Sum of the values}}{\text{The number of values}}$$

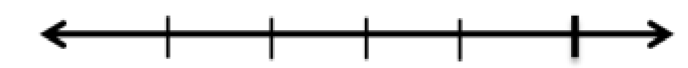
FINDING missing values

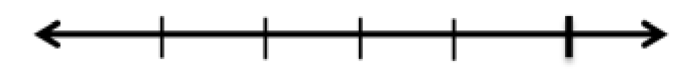
The missing value **=** [The number of values x the mean] **-** [The sum of given values]

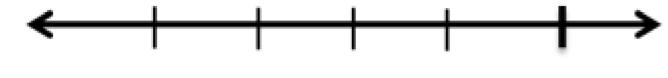
Calculate the mean of the following data using balanced point.

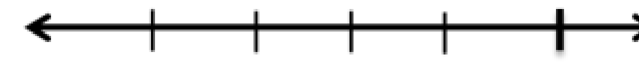
A) 3, 4 , 6 , 7 , 8 , 8 , 6 , 6

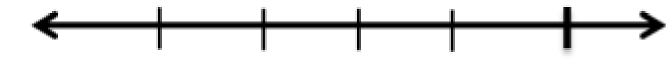




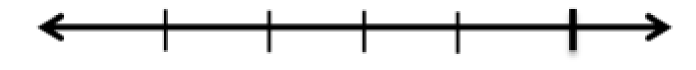


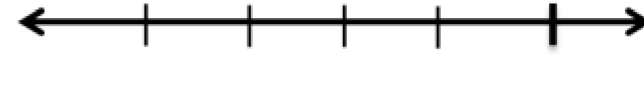


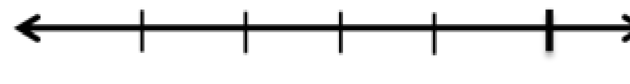


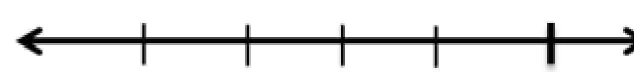


B) 7 ,7 ,10 ,9 ,12











Find the Value of x

A) 11 , 20 , X , 7 ………………

mean= 14 …………………………..

…………………………………………..

B) 8 , 6 , x , 5 …………………………..

mean = 5 ………………………………

…………………………………………….

C) 19 , X , 4 ,12 , 4………………..

mean= 11 ………………………..

…………………………………………..

D) 4 , x , 19 ……………………………

mean= 10 ……………………………..

…………………………………………

E) 12 , 21 , X , 8 ………………..

mean= 15 …………………………..

…………………………………………

F) 18 ,11 , 15 , X , 16 …………………

Mean =16 ………………………………..

…………………………………………

Answer each of the following

1) Sameh runs 4 km on Sunday, 3 km on Monday , and 5 km on Tuesday. Find the mean of distances covered by Sameh

………
………
………

2) There are four trees , whose heights records as 14 dm , 7 dm , 9 dm , and 6 dm . Determine the mean of the trees heights

………
………
………



Lesson 3 :- Exploring median, mode, and outliers

Mode :- is the value that occurs most often .

EX ;- Mode from set of data

- 5 , 3 , 8 , 9 , 8 , 12 the mode is 8 .
- 3 , 7 , 2 , 7 , 3 , 8 the mode is 7 , 3 .
- 15 , 16 , 9 , 18 , 11 there is no mode .

Outliers: - outliers are values that lie outside (is much smaller or greater than) most of the other values in a set of data .

EX :- Finding outlier from a set of data :-

24 , 23 , 7 , 28 , 26 , 26 , 29 . solution The outlier is 7

Exercise

1)Find the mode of each of the following.

a. 7, 6 , 4, 8 , 2 , 5 , 11 , 4

b. 1 , 1 , 1 , 3 , 3 , 4 , 4 , 5

c. 131 , 131 , 131 , 140 , 140 , 142

d. 6 , 2 , 5 , 6 , 4 , 1 , 6 , 2 , 9

e .7, 17 , 7 , 17 , 7 , 17 , 7 , 17 , 7

f. 21 , 26 , 26 , 29 , 29 , 29 , 31

2)Select the outlier in each of the following data set.

a) 101, 103, 105, 102, 107, 106 , 7,000 , 104

b) 2.3 , 2.2 , 2.1 , 2.9 , 26 , 2.5 , 2.4 , 2.8

c) 70, 11, 12, 13, 15, 16, 17, 14, 19

d) 1 , 3 , 2 , 5 , 4 , 76 , 6 , 7 , 9 , 8

e) 2020, 2021, 2022, 2023, 2024, 1975



3).Complete.

a) ……………….are values that lie away the other values.

b) The outlier value of the data set [7 , 46 , 48 , 49 , 50 , 51 , 52]is …………

c) The two outlier values of this data set

[31 , 205 ,207, 200 , 201 , 206 , 202 , 209 , 1,000]are …………..and…………………..

d) …………..is the measure of central tendency changed more with the outlier.

e) The better measure of central tendency for data set with outlier value is ………………

f) …………………..is the better measure of central tendency for data set with no outlier

g) The ……………….is the value that occurs most often.

h) The mode of [7 , 10 , 15 , 7 , 10 , 13 , 7 , 15 , 7] is…………….

4)choose the correct answer

1) mode is the ………… of the data.

A. most occurs value B. middle value C. average value D. none of these

2) A set of values with two modes are

A. bimodal b. multimodal c. trimodal. D. no n-moda l

3) Which of the following data sets has 2 outliers?

A. 2,704 ,3 ,7 ,5 ,6 ,9.

B. 202,200 ,201 ,203 ,17 ,204,205.

c. 13,40,41 ,42,43 ,44,7O.

o. 62,65 ,63 ,61 ,60 ,64,66

4) Which of the following data sets hasn't any outlier?

A. 72 ,75 ,70 ,7't ,1OOO ,73 ,74,

B. 1 ,2,19 ,3 ,4,5 ,0.

c. 19 ,21 ,20 ,99 ,29 ,23 ,25.

D. 301,307,302,305,304,303.



Lesson 4: Exploring the Range

Range = greatest value – smallest value

Complete the following

A) The difference between the greatest value and the smallest value in data set is Called……………………………………………..

B) The range of the numbers 19 ,14 ,9 and 3 is …………………………………..

C) The range = …………………..-………………………….

d) lf the range of data set is 34 and the lowest value is 45 , then the highest value is……

E) lf 87 is the greatest number of data set and the range = 39 , then the smallest number of this data set equals ……………………………..

F) if the values of data set start from 30 to 60, then the range of this data =……………

G) Lf the marks of 6 pupils in one of the tests are 29 ,33 ,57 ,40 ,36 and 49 , then the range for these marks is equal to ………………………………………

Calculate the range of each data set?

A) 4 , 5 , 5 , 6 , 1 …………………………………..

B) 1 , 6 ,4 , 9 , 1 , 2 ,3 , 6 , 5 ,4……………………………….

C). 13 ,17 , 21 , 25 , 26 , 3 1 ………………………………..

D) 103, 105 ,100 , 102 , 109 ,110……………………………

E). 3.1 , 2.5 , 5.2 , 1.3 , 7.7 ………………………………………..

F). 6.6 , 5 .5 , 3.3 , 2.2 , 9.9………………………………………